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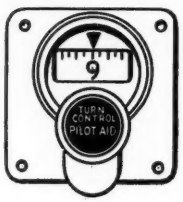

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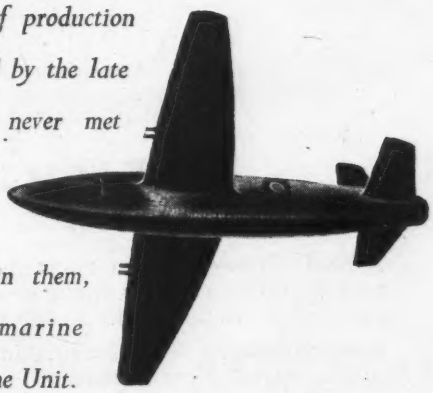

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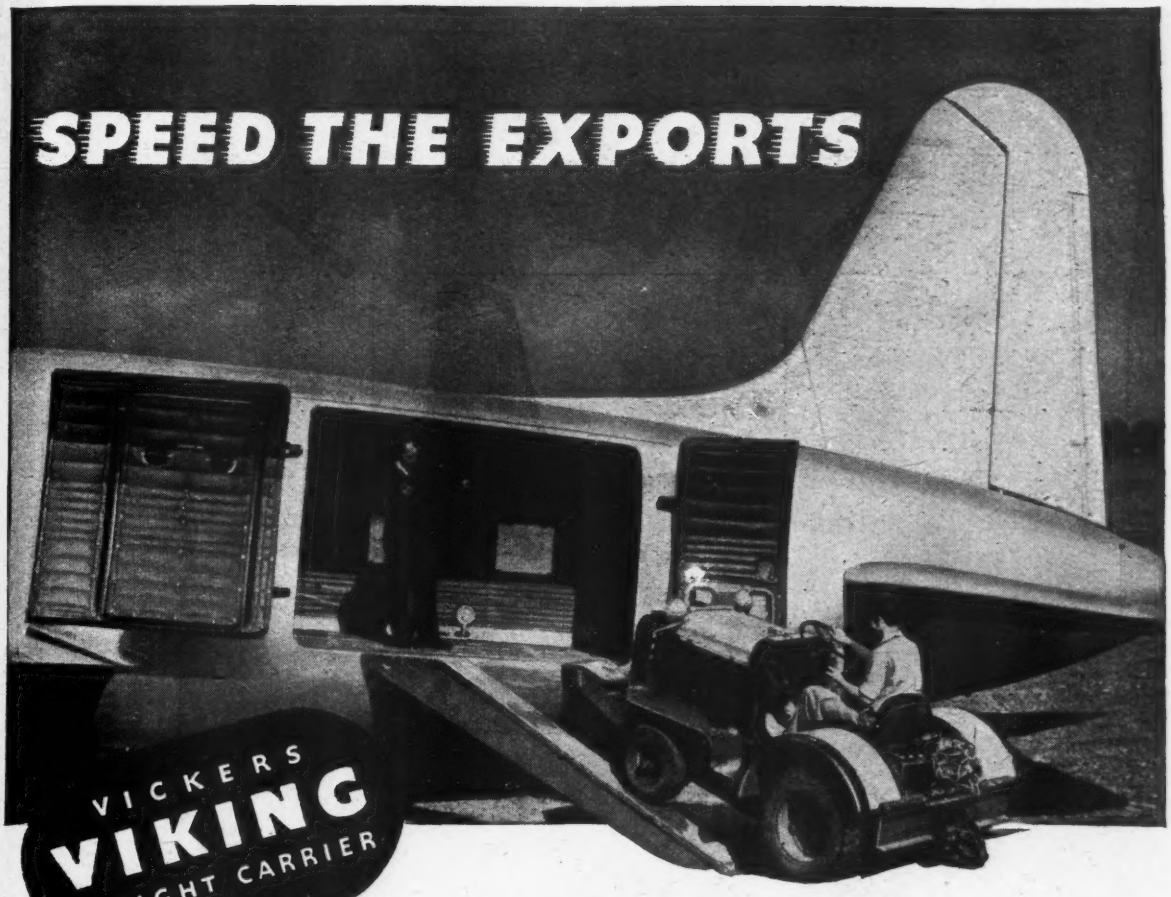

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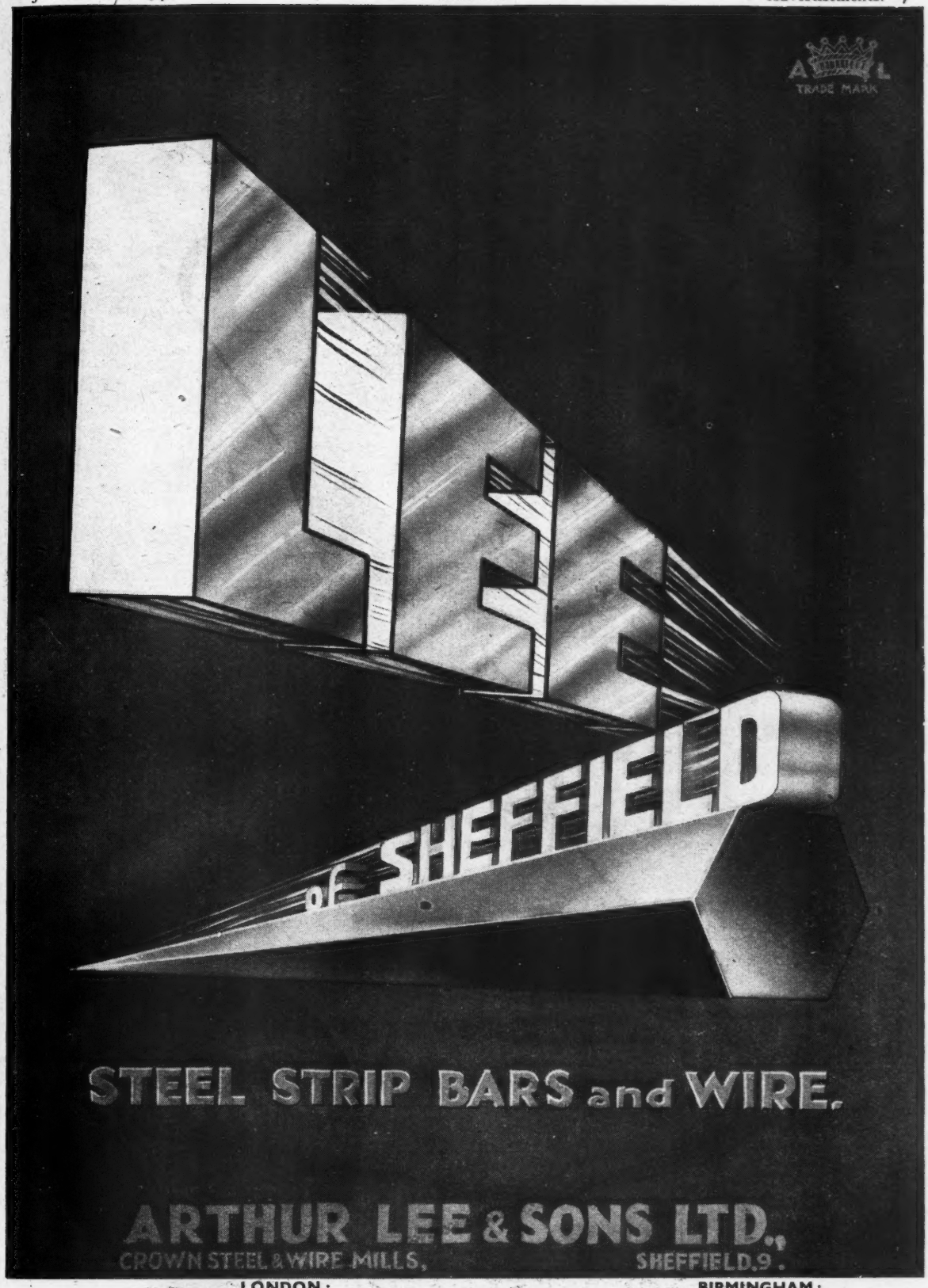

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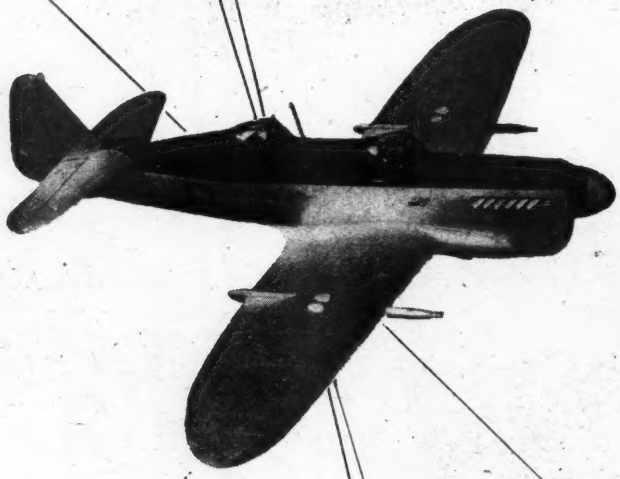

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The Outlook

£2 Million

BRITISH nationalized commercial aviation has not got off to a very good start. The first balance-sheet published, that of the British European Airways Corporation, shows a loss of some £2 million. Rumour had saddled it with an even greater loss, but the actuality is bad enough in all conscience. The taxpayer may well grumble at having to pay for what probably appears to him a luxury enjoyed by a few who could, in any case, have afforded to pay more for their transport. He is unaware, and would probably not be very interested if he knew, that the fares on the Continental routes are fixed by international agreement, and that, as the report points out, they have not generally kept pace with the rising costs of airline operation.

To that section of the public which takes more than a passing interest in aviation, the picture does not look quite so hopeless. It is only too easy to dismiss the whole affair by saying that the loss shows gross inefficiency in management. That is the sort of talk which one hears on many sides. But if one wishes to be fair to the Corporation, the explanations given in the report should be studied carefully. In our view they are quite reasonable, and they go a long way towards showing that many of the factors which entered into the operations were beyond the control of the members of the B.E.A.C.

One important factor was the compelling need to operate uneconomical aircraft when the Viking, which is now a very useful type, was taken out of service because of the instability caused by icing of the tail, on December 8th, 1947, in order that modifications could be introduced. At the same time the fuselage was lengthened so as to give room for three more seats. The aircraft were not returned to service until after March 31st, 1947, the end of the period covered by the report. A good deal of revenue was lost through that cause, not to mention four months' operating experience.

Another cause of extra expense and loss of revenue was the lack of ground facilities. At Northolt, for instance, there were no proper lighting and heating arrangements in the hangars. The consequence was that night maintenance was impossible, and the aircraft could not be fully employed. Airport and navigational facilities were also inadequate, both at home and abroad, and on the European routes three out of every ten services had to be cancelled during the hard winter in February and March. The lack of navigational and blind-approach aids meant that the aircraft had to carry extra fuel, in case of diversions, and that meant loss of payload.

On the internal services the Corporation was handicapped by the high landing fees charged and by having to pay the full duty on fuel and oil. In a full year's working it is estimated that the cost of landing fees would amount to £200,000, while duties on fuel and oil would account for about £100,000. The landing fees charged at home are, generally speaking, higher than those charged on the Continent.

The unfair system of priorities has also been a thorn in the side of the Corporation. The priority seats were paid for only if used, and cancellations generally came too late for the seats to be sold to ordinary passengers. In that way a loss of £26,000 was incurred.

There are many other items which contributed to the large deficit, but those mentioned will serve to indicate that, while there may be room for improvement in management, the Corporation could hardly have been expected to show a profit in the circumstances.

The Operational Side

ONE very commendable feature of the B.E.A.C. report is the clearness with which the accounts are presented, and the very full and frank explanation of how some of the less obvious figures were derived. The admission is made that, in order to be able to submit the accounts within a reasonable time

after the close of the financial period covered, estimates had to be made, but it is thought that these estimates are reasonably accurate. The report as a whole is a model of what such a report should be, and it is to be hoped that when those of B.O.A.C. and B.S.A.A. are published they will be equally lucid.

That part of the report which deals with operational statistics is especially interesting. We are very glad to find that, to take an example, the regularity of operation is expressed by giving the figures for services scheduled and services completed. In the early days of air transport it was customary to state the number started and the number completed. In that way a company could show close on 100 per cent reliability by confining its flights to days of perfect weather. In the period under review, B.E.A.C. scheduled services numbered 10,191, of which 8,417 were completed; 208 were not completed, and 1,566 were cancelled due to weather, etc. If, therefore, ground aids had been better, there is no doubt that the number of completed services would have been very much greater.

The interesting fact is disclosed that the Dakotas put in by far the greatest number of service flying hours (15,230). If the Vikings had not had to be withdrawn for most of the period under review, they would doubtless have reached or even exceeded this figure. As it was, the Dominies (45) were second with 2,504 hours. It cannot be said that the utilization figures for either are impressive, even when bearing in mind that the period in question for the internal services is only two months and that for the Continental services eight months. We appear to be still a long way from that 3,000 hours per annum about which some talk so glibly when estimating operating costs.

The report stresses the fact that B.E.A.C. attaches supreme importance to safety in air transport. That it has so far succeeded in spite of difficult conditions is shown by the fact that there was but one fatal accident, that near Oslo, in which four crew members lost their lives, one was injured, and three passengers suffered minor injuries. Such a record makes up for a good many shortcomings in financial results.

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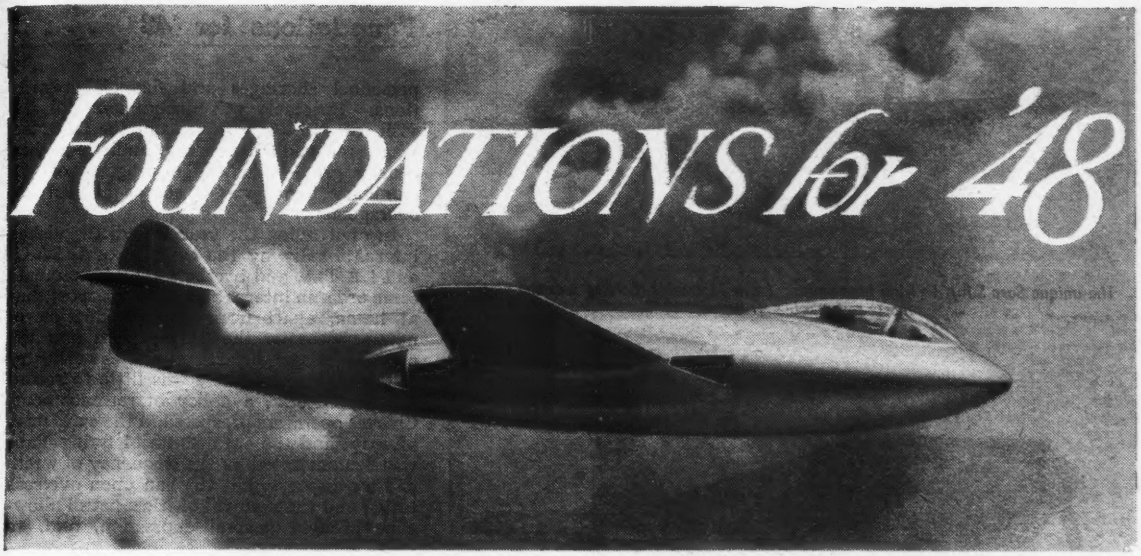
Forthcoming Events, page 22

1947

MIXED is, perhaps, the word which best describes the year that has just closed. If it had its disappointments it also had its minor triumphs. A goodly number of prototypes made their first appearance and gave a glimpse of future possibilities, but it is becoming increasingly evident that with modern aircraft and power plants the road from first flight to service fitness is likely to be a long one. During the year we were able to test for ourselves, and report frankly upon, the characteristics of several aircraft types, ranging from light planes to jet-propelled fighters, a feature of this journal which has been much appreciated, both at home and abroad.

One of the most encouraging features of 1947 was the export trade which the British aircraft industry built up, in spite of many handicaps, and which goes a long way towards redeeming the sorry showing of our civil air transport corporations.

POWER CHECK: The two D.H. Gypsy Queen 70s, here seen running up, will soon lift this prototype Short Sealand amphibian on a first flight over the Belfast Lough. Reversible-pitch airscrews are fitted to these geared and supercharged "Queens" to aid in handling on the water.



FOUNDATIONS for '48

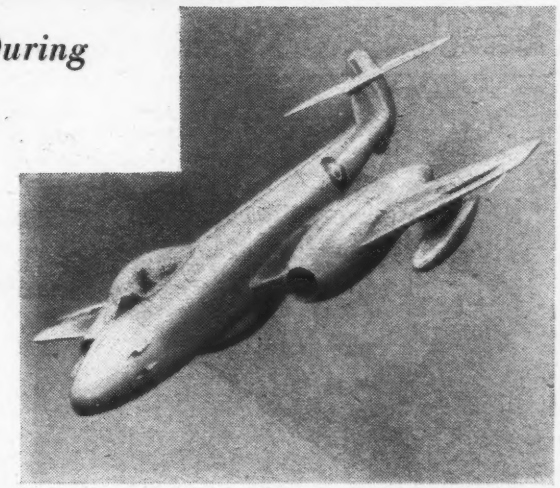
Technical Advances Achieved During the Old Year

TWELVE months ago, when *Flight* reviewed the year 1946, it was recorded that the period had been one of consolidation, development, and especially of research. To a very large extent, that pronouncement holds good for 1947. Several prototypes of great technical interest made their first flights and in many cases appeared in the memorable S.B.A.C. display at Radlett during September. Notable as were these machines, however, they are likely to be exceeded in numbers and importance by the products of 1948, though it will be evident from the following superficial survey that serious gaps remain to be filled in the ranks of British prototype aircraft.

Of the military machines it was the fighters which were chiefly distinguished for their quality. Several hours flying were completed by the Hawker N.7/46, a shapely deck-landing single-seater with a single Rolls-Royce Nene, having twin intakes and twin jet pipes, and mention was made unofficially of a new Gloster design, likewise Nene-powered. Development of the Meteor IV fighter involved the lengthening of the nose and the provision of additional fuel but work was also under way on a two-seater trainer, designated Meteor T.VII. New marks of the D.H. Vampire were introduced—notably the F.III—and at home and abroad the Supermarine Attacker (Nene) demonstrated its remarkable qualities. Initial deck-landing trials were successfully completed by one machine of this type and the new year may see a further development with swept-back wing and tail surfaces. Regrettably no jet bombers materialized, but at least an assurance was forthcoming that such aircraft were under development. Coastal Command squadrons still await their Griffon-powered Avro Shackleton reconnaissance-bombers. On the credit side, Handley Page completed a number of Hermes transports, which, together with the Vickers Valetta will bear the brunt of Transport Command commitments.

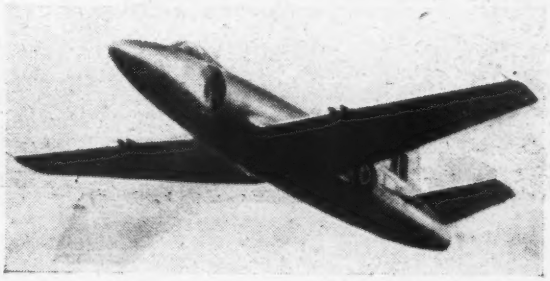
In view of the predominant importance of training in the R.A.F. to-day, special interest attaches to the Boulton Paul Balliol and Avro Athena, both announced during the year, and to the smaller Percival Prentice, already being delivered to meet an urgent Service requirement. From tactical and technical standpoints favourable comment was evoked by the Heston A.2/45 A.O.P. and the Scottish Aviation A.4/45 light transport, both having advanced high-lift systems. Outstanding Naval prototypes were the Westland Wyvern (Eagle) and Blackburn S.28/43 (Centaurus) single-seat strike aircraft, and in the Saro S.R./A1 the R.A.F. received a marine fighter of great promise.

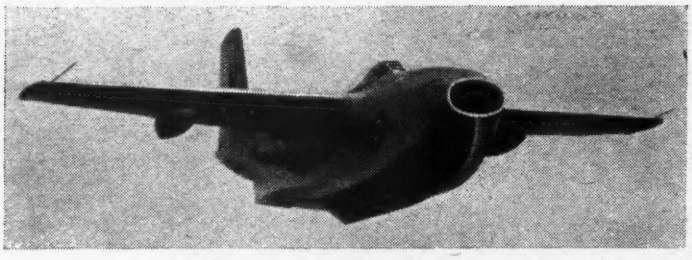
The everyday work of the Services continued in face of



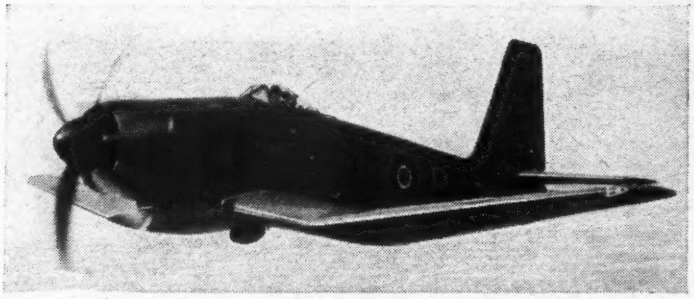
As the year drew to its close, flight trials of the Nene-engined Hawker N.7/46 (top) were in progress. The "long-nosed" Meteor IV (above) was another 1947 development.

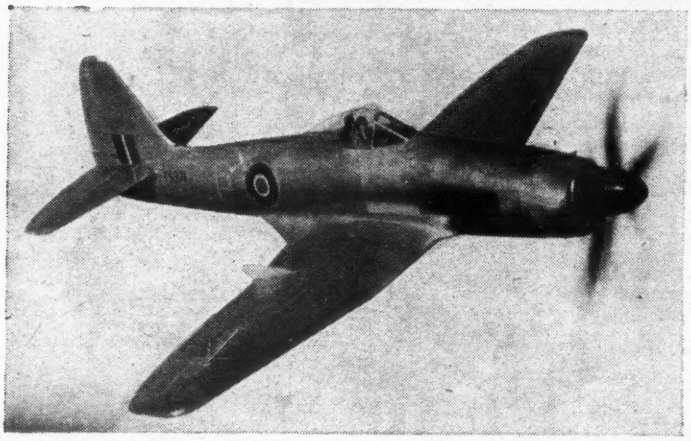
Valuable experience was accumulated with the Supermarine Attacker. The Naval version completed initial deck-landing trials.





The unique Saro S.R./A1 flying boat fighter (twin Metrovick Beryls) was one of the most remarkable fruits of 1947.

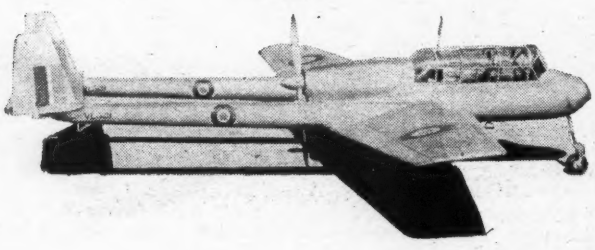




Two naval strike aircraft tested during the year were the Westland Wyvern and Blackburn S.28/43, or Firecrest, seen above. These deck-landing single-seaters are powered respectively with the Rolls-Royce Eagle and Bristol Centaurus.

On the right is the Mercury-engined Boulton-Paul P.108 trainer, prototype of the turbine-powered Balliol, which will fly early in 1948.

The twin-boom machine below is the Heston A.2/45 which, by virtue of its high-lift system, possesses one of the widest speed ranges of any 1947 aircraft. As in the Scottish Aviation A.4/45 (right) the engine is a D.H. Gipsy Queen.



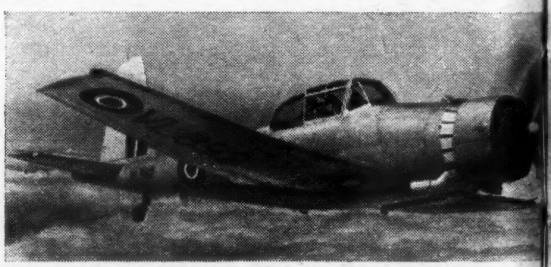
Foundations for '48 . . . . .

personnel shortages and financial restrictions. Spectacle was uncommon and the visit of No. 617 Squadron to the New World relieved an otherwise undistinguished —even grim—year. The progress of the Auxiliary forces was a source of real encouragement.

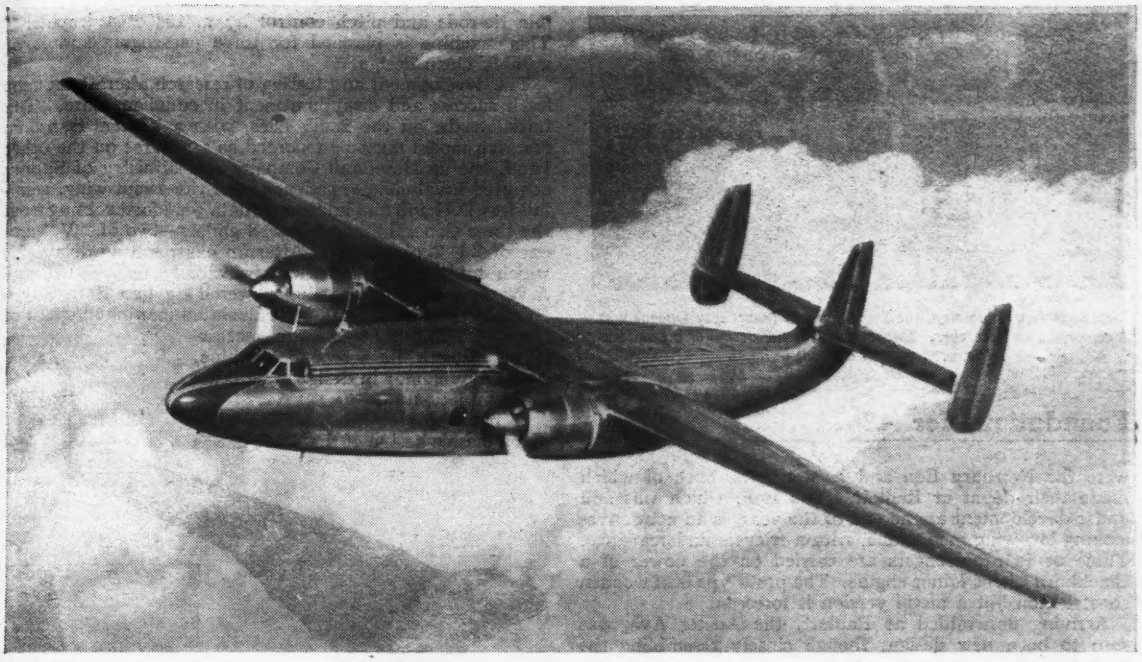
In civil flying the year was distinguished internationally by the energies of I.C.A.O. and I.A.T.A. and by the attempts to create some order in international air transport, but at home, apart from the introduction of new services by the Corporations and the creation of new departments in the Ministry of Civil Aviation, there was little to record except, latterly, a policy of retrenchment. Charter operators prospered in the early days of 1947, and the enthusiasm of flying clubs was demonstrated by the frequency of week-end air displays, but the ban upon overseas travel and the removal of basic petrol allowance brought general depression, and, to some, disaster.

The "Brab." Moved

Reviewing civil transport landplanes in descending order of size, it must be recorded that the first prototype of the Bristol Brabazon (eight Centaurus in pairs) was moved to its specially prepared assembly hall for completion prior to flight trials this year. The only version of the Avro Tudor to see airline service was the Mark IV, three of which were in service with B.S.A.A. at the close of the year. The announcement of an order for twenty-five Handley Page Hermes IVs, intended for Empire routes, was received with satisfaction, as was one for an unspecified number of Airspeed Ambassadors for B.E.A. It may be said that the Industry felt no greater pride in any of its products than in this graceful high-wing Airspeed, with its twin Centaurus engines. Vickers-Armstrongs and Armstrong Whitworth respectively were busy on the first models of their Viscount and Apollo medium transports for which airscrew turbines are foreseen.



Like the Heston A.2/45, the Scottish Aviation A.4/45, or Prestwick Pioneer (below) has an exceptional speed range.



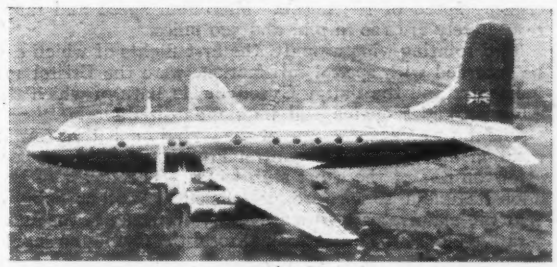
One of Britain's proudest achievements was the Airspeed Ambassador (two Bristol Centaurus), selected late in the year as equipment for British European Airways. For sheer refinement of design this elegant machine is likely to remain unchallenged for a considerable time.

Widespread regret was occasioned by the abandonment —not on technical grounds—of the Cunliffe-Owen Concordia feeder liner, though the lack of this type will be offset by the introduction of the Percival Prince, similarly powered with two Alvis Leonides engines, during the present year. The smaller Gipsy-powered Merganser was flying during the latter half of 1947, while Short Brothers were putting the finishing touches to the Sealand—a machine which, in many respects, may be considered as an amphibian counterpart of this type. Miles aircraft of the year included the four-engined Merchantman, a larger machine following the Aerovan formula, and the M.68, a light freighter, having a detachable "box-car" fuselage. Marathons were in production for the short-range services of British European Airways, but not, as had at one time been planned, with Armstrong-Siddeley Mamba gas turbines. Four D.H. Gipsy Queens are fitted.

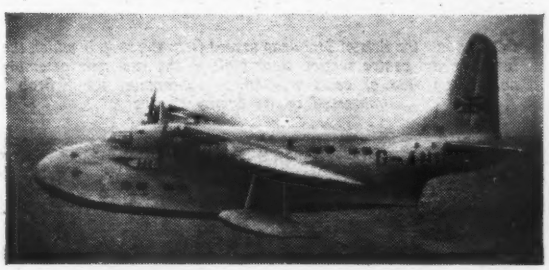
S.R.45 takes Shape

In the Saunders-Roe factory at Cowes, the hull of the great S.R.45 transoceanic flying boat (ten Proteus gas turbines) began to take form. Meanwhile, the second Shetland, a joint product of Short and Saunders Roe, was flown. The first of a series of Short Solents, smaller boats than the Shetland and more closely akin to the well-established Hythe, set out on a proving flight during December.

The only new types of light aircraft which materialized

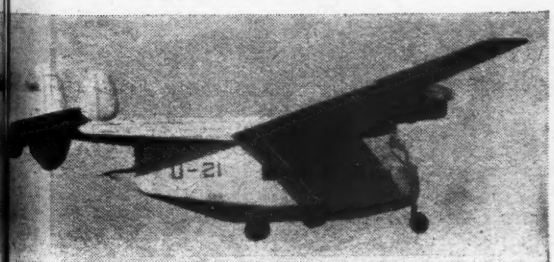


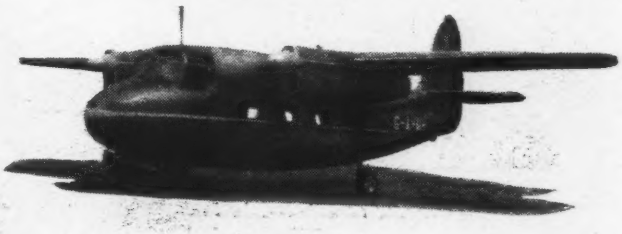
Encouraging results were obtained with the Avro Tudor IV (four R-R. Merlin) on the South Atlantic route of B.S.A.A.

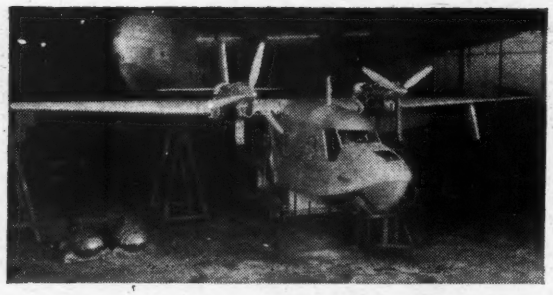


A Short Solent, as shown above, was engaged on a proving flight late in the year. Below is the Percival Merganser, an attractive 1947 product for feeder-line or charter work.

An imaginative "utility" transport was the Miles Merchantman, demonstrated at Radlett.







An appealing amphibian, the Short Sealand (two Gipsy Queen) was completed in December. During the year the design of a Leonides-powered version was put in hand.

Foundations for '48 . . . . .

were the Newbury Eon and Auster Avis, both of which made their début at Radlett. The Eon, which was still under development at the end of the year, is an attractive-looking low-wing monoplane, with a tricycle undercarriage. Three or four passengers are carried on the power of a Blackburn Cirrus Minor engine. The prototype is of wooden construction but a metal version is foreseen.

Arriving unheralded at Radlett, the Auster Avis was seen to be a new design, though closely resembling the Mark VI, in common with which it has flaps of aerofoil section. This promising little machine was produced to carry four persons and 100 lb of luggage in comfort at a cruising speed of 100 m.p.h. Maximum speed and range respectively are 120 m.p.h. and 500 miles.

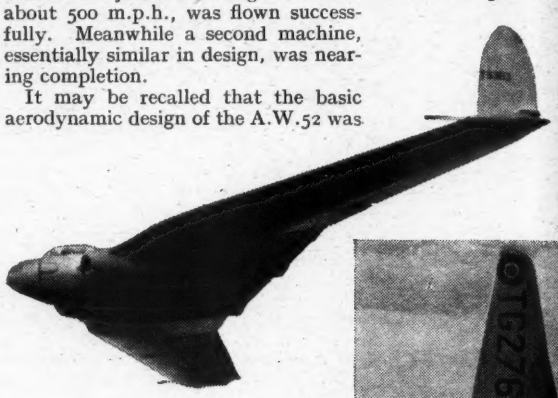
Two rotating-wing aircraft, the first flights of which can be recorded with special satisfaction, were the Bristol 171 helicopter and the Fairey Gyrodyne, in both of which the Alvis Leonides engine will be standardized.

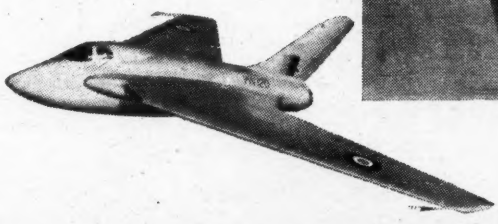
The most unusual feature of the Gyrodyne is that torque reaction and directional control are obtained by an air-screw on one of the short stub wings. The thrust of this adds its quota to forward propulsion. Another point is that the main rotor blades are always working in the auto-rotative pitch range. In its final form the Gyrodyne should have a cruising speed of 100 m.p.h. and a range of 230 miles.

Generically akin to the classic Sikorsky designs, the Bristol 171 differs in having rotor blades mounted on flexible tie-rods and pitch control by means of a "spider." This machine is planned for three passengers and is of notably clean design.

The development and testing of research aircraft brought forth success and disappointment in equal measure. The initial trials, off the Scilly Isles, with a Vickers transonic research model must be recorded as a failure; on the other hand, the de Havilland Company and Ministry of Supply acquired invaluable experience with the swept-wing, semi-tail-less D.H.108 and additional data were forthcoming from the three General Aircraft towed gliders—two of "V" and one of "U" plan form. After an exasperating delay, for which hydraulic trouble was principally responsible, the A.W.52, a near flying wing powered by two Rolls-Royce Nene turbo-jets and having a calculated maximum speed of about 500 m.p.h., was flown successfully. Meanwhile a second machine, essentially similar in design, was nearing completion.

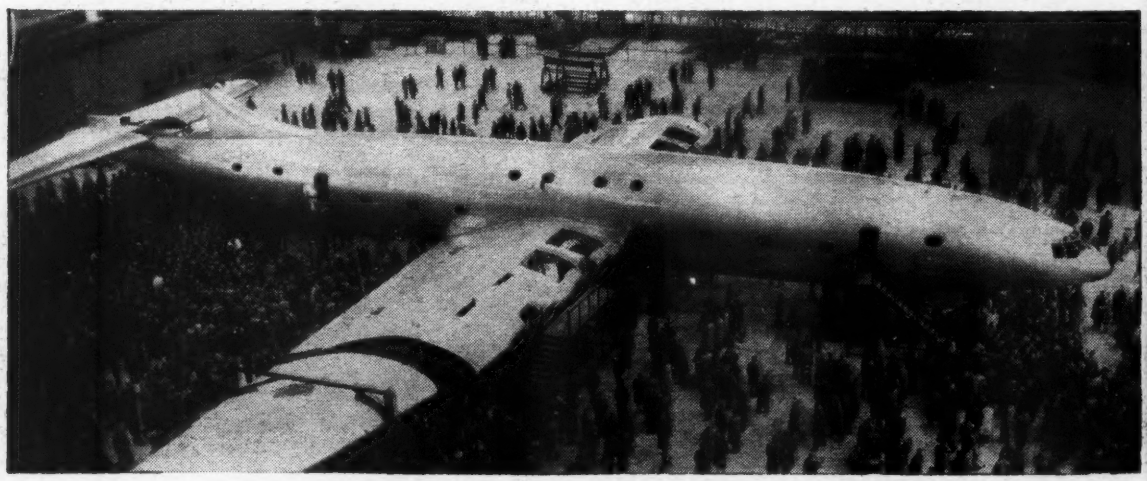
It may be recalled that the basic aerodynamic design of the A.W.52 was

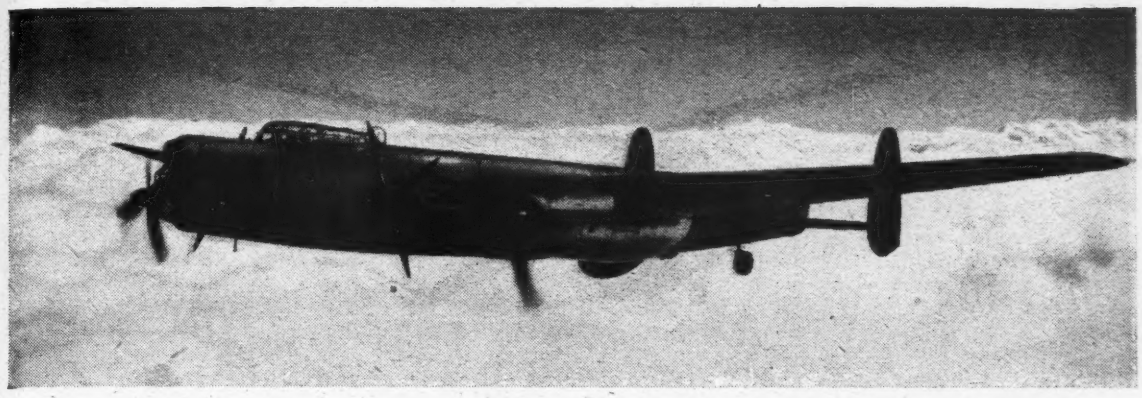




Delayed by hydraulic troubles, the first A.W.52 (above) flew later in the year. Vital tests of the D.H.108 (below) continued and the Nene-Vampire (right) reached 51,000 ft.

October saw the Bristol Brabazon moved from the shop in which the fuselage and centre section were built to the vast new assembly hall. Seen free of constructional paraphernalia, the "Brab" impressed by its beauty of line.





First of the airscrew turbines to fly, the Bristol Theseus, two examples of which are seen in their Lincoln flying test bed, also boasts receipt of the first type test certificate for this class of power plant.

tried out during 1946 with the A.W.52G glider. In addition to its swept-back wing, the full-scale jet-propelled machine embodies a number of very advanced features, for example, boundary layer control by suction, a pressurized crew compartment, and a steerable nosewheel. Though not altering appreciably the stalling speed of the aircraft, the boundary layer control is intended to delay the loss of control due to wing tip stalling. Data for the A.W.52 are: Take-off weight, 33,000 lb; gross wing area, 1,314 sq ft; span, 90ft. Cruising at 330 m.p.h. at 36,000ft the machine is estimated to have a range of 1,500 miles.

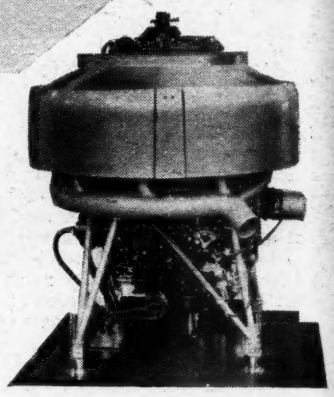
From the foregoing, it will be appreciated that, though less complete than could be wished, the range of British military and civil aircraft types has undergone an important expansion in the period under review.

POWER UNITS, LARGE AND SMALL

AFTER the spate of new gas turbine and piston engines which followed the war, it may be regarded in some ways as encouraging that very few new power units have been announced during the past year. It can be taken to indicate that engine manufacturers are satisfied with their latest designs and have been able to concentrate on developing them from prototype to production stage, a task which now takes years rather than months. Thus the talk of engines has been concerned primarily with improvements in detail design, flight testing of the more advanced types and with reliability and fuel consumption. A comparatively new class of aircraft, the mixed-engine flying test beds, have greatly increased in importance.

First of the four-engined test beds was the Rolls-Royce Nene-Lancastrian which has provided much of the data required for the preparation of the Nene-Viking and Tudor VIII. A very similar aircraft is the D.H. Ghost Lancastrian, first of two or more, which is supplying vital

(Above) *Two "Mambalancs" are to be used for development and research, and the first has been flying for several weeks. A similar five-engined layout is used for flight testing of the Rolls-Royce Dart below. The Ghost Lancastrian, lower right, has for some time been providing advance engine operating data for the D.H.106 which is to have four Ghost gas turbines.*



The first flight, last summer, of the Bristol 171 helicopter marked an important stage in the company's and country's progress with rotating wing aircraft. Alvis Leonides helicopter power plants (right) are to be installed in later machines.

Foundations for '48 . . . . .

information, in conjunction with a Ghost Vampire, for the D.H.106. A third test bed, again with its two inboard Merlins retained and those outboard exchanged, is the Theseus Lincoln. Figures and experience with this machine will provide data for not only Theseus installations but for the larger Proteus airscrew turbines which are to power production Bristol 167s following the Brabazon I. First stage in building the 3,500 h.p. Proteus was the design of the experimental pure jet Phœbus.

News is expected very soon of the first flight of Armstrong Siddeley Pythons installed outboard in a Lancaster. These powerful contra-prop units have undergone a year of intensive development.

Smaller airscrew turbines are tested by installing them in the nose of a four-engined aircraft and so introducing a five-engined class. So far the Armstrong Siddeley Mamba and Rolls-Royce Dart have commenced their flight testing in this manner. Later, the only new airscrew turbine of the year, the 1,500 h.p. Napier Naiad, will probably fly in such a five-engined arrangement.

For the Metrovick it has been a most important year, if only because a pair of F.2/4s flew for the first time as primary power units of the unique new Saunders-Roe fighter boat. Other units are being tested in a Meteor and in a Lancaster II in which the rear turret has been replaced by the jet unit.

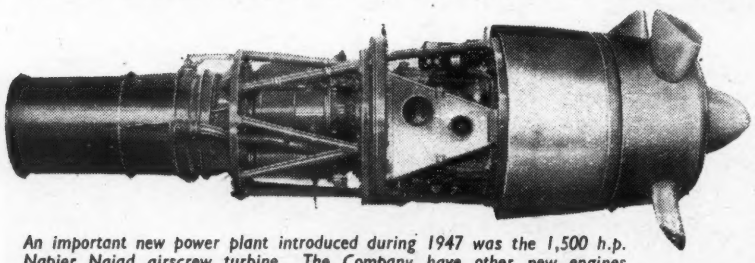
Pure jet Goblins I and II, Derwent Vs and Nenes have continued to give good service in their respective squadron and prototype military aircraft. In addition to improvement in reliability considerable increase in power output has been achieved experimentally from these engines.

Piston engines, particularly the larger civil power plants, have continued to hold their important position in spite of jet intervention. Merlin 620 power plants have given good service in D.C.4Ms on the North Atlantic route, and a civil Griffon unit is under development. Hercules and Centaurus units have also operated extensively in commercial transports. The latest series of these civil Bristol power plants are the Hercules 730, 750 and 760, and Centaurus 630.

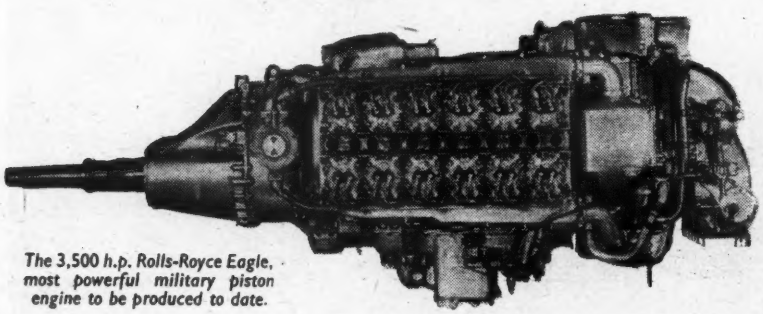
An important and powerful new military unit, the 3,500 h.p. Rolls-Royce Eagle, with 24 cylinders and sleeve valves, flew for the first time in the Wyvern strike fighter.

Alvis Leonides engines have put in a number of flying hours and a unit adapted during the year as a helicopter power plant shows promise for installation in the Bristol and Westland-Sikorsky machines. Development of the latest Gipsy Queen and Major Series engines has continued, and many installations are now in view for the various normally aspirated and supercharged marks. The geared and supercharged 345 h.p. Queen 70 has been particularly prominent.

It should not be long before the Bombardier, first of a new Blackburn Series, is ready to commence flight development prior to augmenting the ubiquitous current Cirrus Minor IIs and Major IIIs. Development work continues on the Jameson and Monaca engines, both flat four designs of about 100 h.p. output.



An important new power plant introduced during 1947 was the 1,500 h.p. Napier Naiad airscrew turbine. The Company have other new engines under development.



The 3,500 h.p. Rolls-Royce Eagle, most powerful military piston engine to be produced to date.

In Production – for the Royal Air Force

The Percival Prentice T. Mark I three-seat trainer is now in production for use by the Royal Air Force both at home and overseas. Its uses include basic flying training, aerobatics, instrument and night flying, navigational and radio training. Designed to Air Ministry Specification, the Prentice is of metal construction and is powered by a 250 h.p. De Havilland Gipsy Queen "32" engine. Electric intercommunication and radio, including Standard Beam Approach equipment, are fitted.

The windscreen accommodates instrument flying training screens which may be quickly placed in position or stowed away whilst the machine is in flight.

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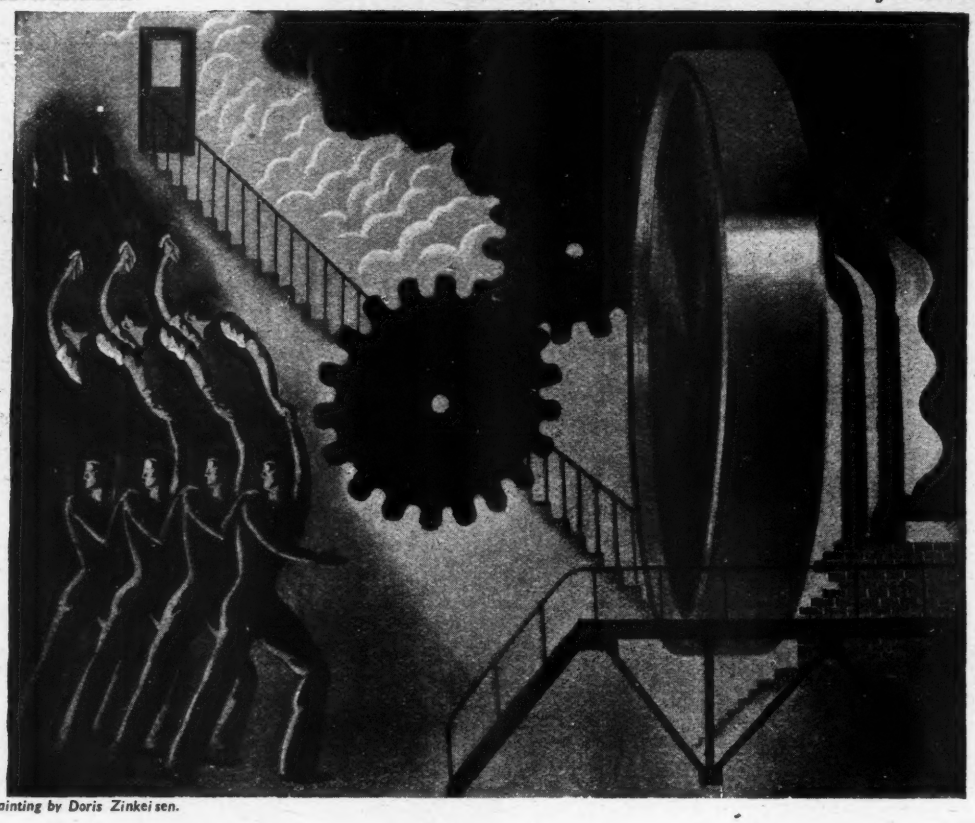

Painting by Doris Zinkeisen.

This Present Age . . 2

It is a proud record that there has been no major stoppage in the iron and steel trades during the last half century. The machinery of negotiation between management and labour is well established, but of greater importance is the readiness to use it and the faithful observance, by both parties, of its procedure and decisions. All controversial questions are discussed in an atmosphere of tolerance and sympathetic understanding, since the ultimate objectives of all are the economic prosperity of the industry, continuity of employment, and a progressive betterment of working and living conditions. The foreman is the first important step in management. He is promoted because of his intimate knowledge of his fellows and his skill and ability to instruct and control. Higher management in industry is now a salaried profession. It is open to all who possess a flair for human understanding allied with gifts of a high order, not the least being vision, leadership and powers of administration. Just as the chain of command in any army extends unbroken from the ranks to the Commander-in-Chief, so in an industrial organisation, the sequence from the workers through the foreman to the highest executive is equally important. Between all sections, the principles of equity and justice are the essence of our policy.

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HERE AND THERE

PIGEON PORTRAIT : An impression left in dust on a wet window in Holborn by a pigeon in full flight, which is referred to below.

Air Travel as an Aid to Shipping

A DIRECTOR of D.N.L. and chairman of S.A.S., Mr. Ths. S. Falk, has been elected president of the Norwegian Shipowners' Association. In a recent speech Mr. Falk said that as traffic promoted more traffic, air services would not take passengers from shipping, and by enabling shipping executives to make more extensive contacts and market studies, rapid air travel was of great benefit to shipping. Accelerated supply of spares for ships held up by breakdowns and transfers of crews had also the greatest possibilities.

N.P.L. Appointment

THE Council of the Royal Society has appointed Sir Frederick Handley Page to represent the R.Ae.S. on the General Board of the National Physical Laboratory.

Unique Record of Flight

A PIGEON recently flew into a newly glazed window in a building in Holborn, and left a unique "dustograph" with dust shaken out of its plumage on to the wet window by the impact. The photograph on this page was taken by Mr. George Miles, of Gilchrist Studios, Ltd., at the request of Dr. A. P. Thurston. So clear was the dust impression that the tongue in the open beak showed clearly. The body was not found and it is presumed the bird recovered; probably he imagined that he had hit the sonic barrier.

Pact with Peru

PERU and the U.K. have signed a bilateral air pact, each country giving the other landing rights and facilities for scheduled air services including services between Peru and certain British colonies.

Far East Engineering Society

AN engineers' society which is later to be a branch of the British Society of Licensed Aircraft Engineers has been started in Singapore. The organizer is Mr. Charles Short, of Qantas. Five members have been accepted and ten more applications have been received from employees of Qantas and Malayan Airways.

Bonanza Ambulance

AN ambulance conversion for the four-passenger Beechcraft Bonanza has been designed by the makers. In this form, the machine carries three—pilot, patient and nurse. The patient has a special stretcher which can be loaded over the leading edge of the starboard wing.

H. M. Hobson Directors

A NUMBER of appointments have been made to the board of H. M. Hobson, Ltd. The new directors are Messrs. A. J. Aiers, C. Clifford, N. V. Dams, T. Simpson and P. H. Stokes. Mr. W. M. Iliffe has retired from the board.

Long-range Missiles

IT is estimated that nearly 2,000 workers will be employed in developing long-range rockets in Australia, where a new township to house some of them is being built near Adelaide.

Faireys in Australia

OWING to an error in transcription, the appointment of a Fairey representative in Australia was incorrectly reported in our December 25th issue. It is A. Cdre. F. Kirk, O.B.E., who has been appointed to this position.

Airlines' Complaint

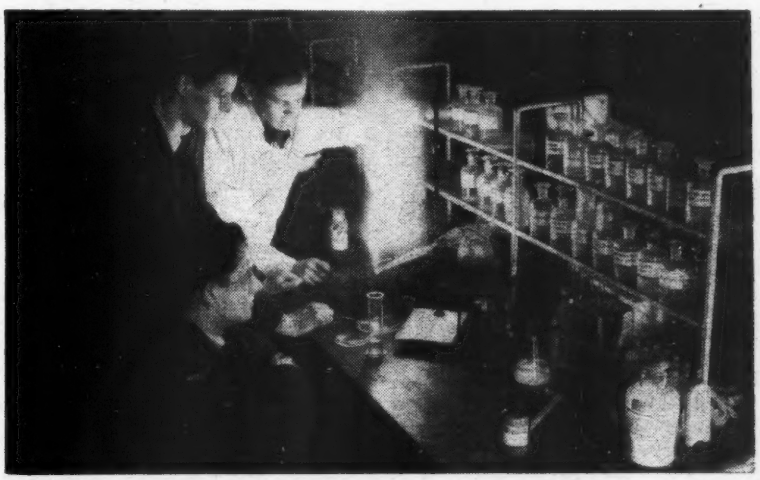
WHEN the Prime Minister of Australia expressed his intention to fly to New Zealand for a holiday in his private Dakota, the Air Board decided that on safety grounds a four-engined aircraft should be used. Private operators complained that there were twice-daily T.E.A. scheduled flying-boat services available, and that the use of an R.A.A.F. Liberator would waste 2,500 gallons of petrol.

Fire Detector

A NEW fire detector for aircraft has been introduced by Control Products Inc., Harrison, N.J., U.S.A. The CPJ detector actuates the alarm system, it is claimed, in under the allowable five seconds when exposed to a temperature of 2,000 deg. F., and also indicates "fire out" rapidly. The weight is approximately one ounce; normally open circuits requiring no relays are used, and the device is hermetically sealed.

Two New Wind Tunnels

AN all-steel wind tunnel, with a working section 9ft by 7ft and highly-finished welded joints, is nearing com-



GERMAN INSTRUCTORS with airmen at Buckeburg on one of the fifteen one-month courses provided for airmen and airwomen by B.A.F.O. In this case the subject is chemistry, and among further courses to be started is "garage repairs."

HERE AND THERE

pletion at the Vickers works, while by 1948 it is expected that the experimental tunnel for supersonic speed research will also be operating.

Hong Kong-Shanghai Service

ON December 16th the first flight on Hong Kong Airways new route between Hong Kong and Shanghai was completed when a Dakota arrived at Shanghai with a number of newspapermen on board. The airfield used was Lung Hus.

Miles Service

ALTHOUGH Miles Aircraft, Ltd., is in receivership at the moment, the Repair and Service department is functioning normally and operators of Miles aircraft can receive all the usual services from this department, which is under the direction of the chief technical officer, Mr. J. W. Angell.

Airfields in Norfolk

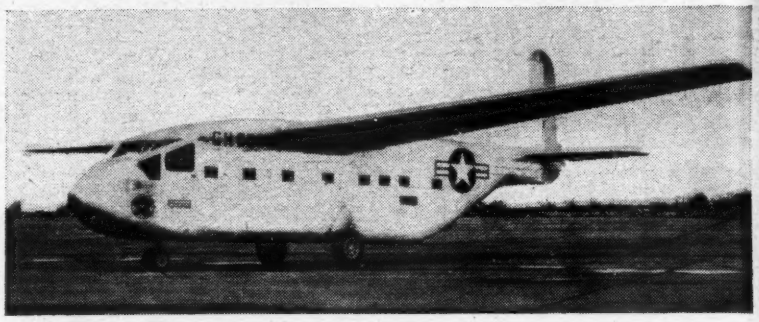
ABOUT 21,000 acres of land in Norfolk are covered by airfields, 9,300 acres of which are farmed, according to the Minister of Agriculture, in a reply to a question in the House of Commons recently.

America's A.T.C.

AMERICA has an equivalent to the A.T.C. in the Cadet branch of the Civil Air Patrol, an organization started for the purpose of mustering the country's private flyers and aircraft during the war and which carried out 24,000,000 miles of coastal patrol, as well as supervising frontiers and communications. The Cadet branch now has 49 Wings with a membership of about 75,000 boys and girls, who study all aviation subjects such as navigation, radio, meteorology, engines, instruments and airframes. No flying training is given, although cadets are encouraged to learn to fly and are given orientation flights in aircraft on loan from the U.S.A.A.F. Some Wings have scholarship schemes to give outstanding cadets free training.

Met. Flights in Antarctic

WHEN the Falkland Islands Dependencies Survey relief ship *John Biscoe* left Tilbury on December 19th she carried a Hornet Moth, crated, with which Mr. P. A. Toynbee will make flights. After distributing 25 relief men at seven permanently manned bases the ship will return. Besides having on board the men who have been relieved, the *John Biscoe* will bring back charts, maps and information representing 12 months' work by British scientists in the Antarctic. The seven bases have been doing excellent work with daily weather forecasts which have led to discoveries about the route taken by the great Antarctic weather depressions.



AVITRUC : The new all-metal assault glider of this name, now on test prior to delivery to the U.S. Army. The span is 86ft and the designed gross weight in excess of seven tons.

475 b.h.p. Merlin

IN marine form, the Merlin engine used in the latest Thornycroft 50ft passenger and general service launches has a continuous rating of 475 b.h.p. at 2,100 r.p.m. and a half-hour emergency rating of 570 b.h.p. at 2,400 r.p.m. The engine is based on the Rover Meteor, a modified version of the Merlin developed for tanks, which has been further modified by Thornycrofts. It gives the launch a speed of 24 knots and at such a low rating is, of course, suitable for very long periods of continuous work without servicing.

Sound and Fury

A STATEMENT by Col. S. A. Gilkie, Commander of Muroc Army Airfield, expresses sarcastic doubt concerning the reports that the Bell XS-1 rocket-propelled experimental aircraft has exceeded the speed of sound. Col. Gilkie's statement is to the effect, that, although he had only indirect supervision of test flights, he thinks he would have been notified if such flights had been made. "It sounds to me like another flying saucer story," he added. The reports had been based on an item in the American magazine *Aviation Week*, which stated that flights, timed by radar, were made at heights between 40,000 and 70,000ft and that supersonic speeds at these levels had been achieved. If 70,000ft was in fact attained, this would be well above the world's height record for piloted aircraft.

Aviation Education

ONE little-known activity of B.O.A.C. is the supply to students, teachers and lecturers of a very limited amount of material on aviation, such as films, film strips, wall charts and maps, photographs, textbooks, pamphlets and reprints, and periodicals, in some cases free and in others at a small charge. The Board's Education Officer, whose address is Airways Terminal, Buckingham Palace Road, London, S.W.1, is interested in hearing from school teachers their views on what material is required and in getting into touch with teachers who are prepared to help in compiling material. In the meantime a list of materials available and the sources from which they may be obtained has been compiled.

FERRYING PASSENGERS : Trans World Airlines use this smart hybrid between a limousine and a bus to carry passengers from their New York headquarters in 71st Street to the T.W.A. airport terminal.

News in Brief

Mr. Paul E. Lamer, a French parachutist trained at Ringway during the war, plans to return to Ringway to make an attempt to beat the Russian record, which is reported to be a drop of 8½ miles.

* * *

Mr. A. S. Bishop, a director of the Goodyear organization, has been elected chairman of the Tyre Trade Joint Committee in succession to the late Sir Harold Kenward.

* * *

"Caroplane" aircraft in America, such as the Consolidated machine which crashed on test recently, are intended to make use of stocks of detachable wings at the main airfields.

* * *

Westland Aircraft, Ltd. is proposing to pay a dividend of 5 per cent tax free on the ordinary capital, the same as last year. The annual report says that deliveries of aircraft have been on a reduced scale during the year.

* * *

"A woman passenger knitted three inches of a sock while a plane circled London Airport last night . . . ."—*Daily Express*, December 22nd.

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Desynn ' Flight Testing Equipment
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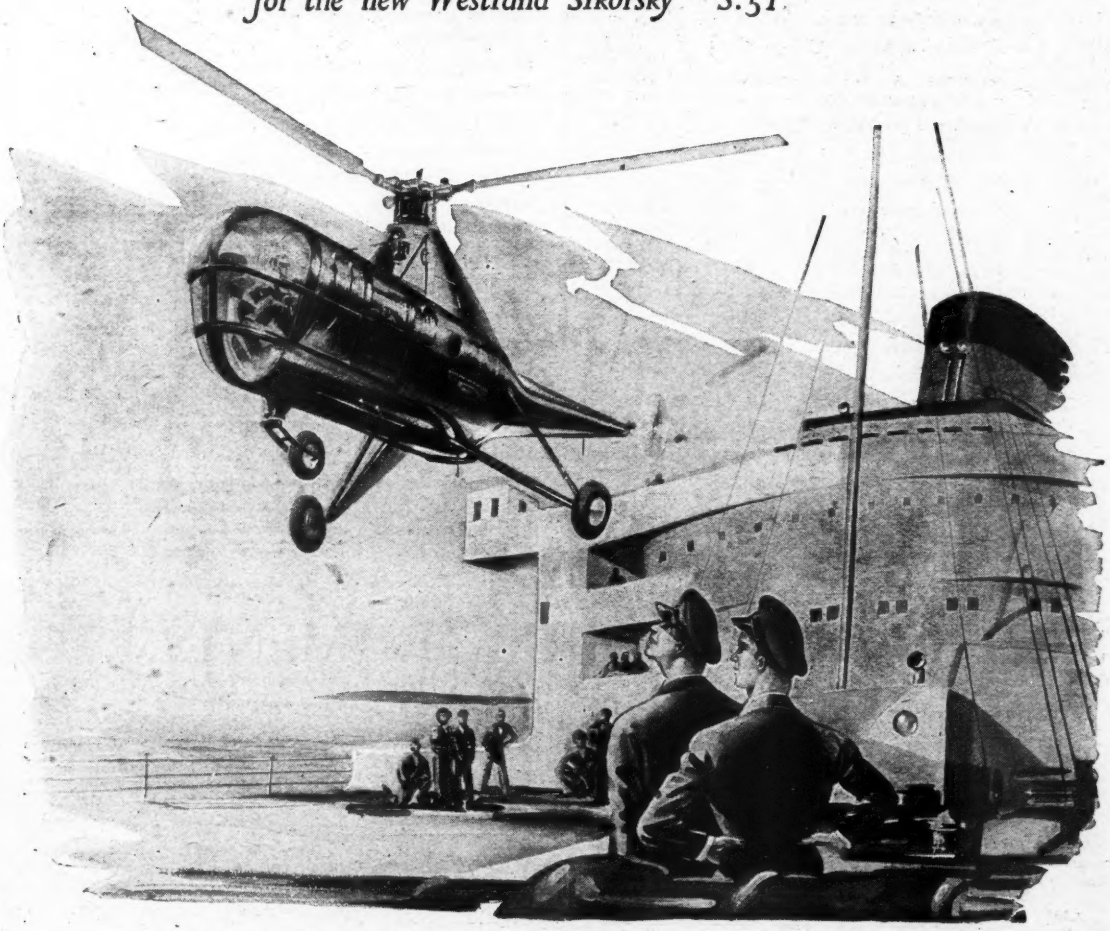

ALVIS LIMITED COVENTRY

American Newsletter

Details of New U.S. Air Force Programme : Orders Sufficient to Keep Manufacturers in Production

By "KIBITZER"

A WEEK or so ago the President's Air Policy Commission (a body that is enquiring into all phases of the aircraft industry over here, and which is doing a most excellent and workmanlike job) heard evidence from the Air Force Secretary and the Air Force Vice-Chief of Staff. What they said was somewhat startling, not only for its contents, but also because it was given at an open hearing. It must have sent the foreign intelligence boys scurrying to their offices, and doubtless gave some of the less friendly friends of the democracies plenty to think about. They gave, in fact, a complete breakdown of the United States Air Force programme, group by group, together with details of the various types now in service, and what was expected of them. (Rocketry and guided missiles were not included!).

All this was evidence of vital importance to the aircraft industry, for not only did it give a glimpse of future requirements, but the secretary made it clear that, provided funds were forthcoming, there would be sufficient orders to keep the manufacturers in limited production in the future. The figure he gave was in the neighbourhood of 3,200 machines per annum, and he suggested that, although it would obviously be impossible to retain the industry in the luxury to which its wartime orders had made it accustomed (and sometimes one gets the impression that some manufacturers consider this is what should be done), they would at least be in a position where rapid up-to-date expansion would be easy if hostilities broke out once more. Naturally, he could not suggest what was to be done about the financing of new civilian types, both large and small. So far as the manufacturers are concerned, that's where they are likely to feel the rub, and about which they are wondering what they do next.

The total programme asked for 6,869 first-line combat aircraft and a reserve of 8,100. At the moment the Air Force has about 40 fully manned groups, which are being increased rapidly by re-activating some of the larger aircraft that were "pickled" and put in storage after V.J. day. This figure will ultimately be increased to 70 groups, of which 20 will be very heavy bomber groups.

An optimistic note was struck when he said that such groups would contain 630 long-range bombers "designed to provide an operational striking force of 500" . . . . rather a high serviceability percentage, but one that gives a nice warm feeling of efficiency and security! The heavy bombers would be B-29s and B-50s from the Boeing factory and the huge Corsair B-36s, of which 100 are said to be on order. These will be bolstered by the new Boeing B-52 and possibly the Northrop B-35 and B-49—if and when they get into production. The medium bombers would be drawn from the new jet-powered aircraft, the North American B-45, the Consolidated Vultee B-46, the Boeing B-47 and the Glenn Martin B-47, all of which are undergoing flight tests and seem to be fairly satisfactory. Production orders for the North American B-45 have, in fact, been placed.

The long-range reconnaissance machines would have to be the Republic XF-12 (Rainbow) and the new twin-boom twin-engined Hughes XF-11, which is now undergoing flight trials at Muroc. So far as is known at the time of writing, neither of these machines has been ordered, but something may happen after the New Year. Short-range reconnaissance would be allocated to the tried jet jobs like the new Lockheed P-80 and the Republic P-84. There are two other types which might be used for this work, the Curtiss-Wright XP-87, a long-range utility type fitted with four Westinghouse axial-flow jets, and the Northrop XP-89. This latter does not follow the normal Northrop wing pattern, but is a straight-wing aircraft with the engine, or it may be engines, in the fuselage under the belly. It has nose armament and room for at least one crew member besides the pilot, and plenty of cameras or radar.

In the fighter class the P-80 and the P-84, and particularly the new swept-back-wing North American P-86, will carry the burden for the time being. Reports on this last machine say it is exceptionally good all round and very fast. Following these more or less conventional types will come the sonic and, it is hoped, supersonic, interceptor fighters. The McDonnell XP-85 (which is a parasite fighter designed to go into the bomb bay of the B-36), the XP-88 from the same manufacturer and then the Lockheed XP-90, the Republic XP-91, and the Consolidated Vultee XP-92. These last three machines will have jet-cum-rocket power, and in view of the stories, which are probably correct, that the Bell XS-1 has approached very close to, even if it has not exceeded, the speed of sound, these last three may well be expected to reach a Mach number of one or over.

The rest of the U.S.A.F. programme consists of troop-carrying aircraft, Transport Command requirements, trainers, and the usual Reserve (2,360 aircraft) and National Guard (3,212 aircraft) Squadrons. These latter are an equivalent organization to our Royal Auxiliary Air Force. The whole programme was welcomed with restraint by the industry, and even if there was a sideways look from those who would have to provide the money (a reaction that was anticipated, and partially offset by a statement that not only had the Russians built copies of the B-29, but that they had 14,000 aircraft in active service, with factories still capable of feeding such squadrons at a high rate of production), there is little doubt that some such programme will be implemented by Congress.

AIR FREIGHT AND CARGO AIRCRAFT

REGULAR readers may, by this time, be thoroughly fed up with my continual mention of the possibilities of air freight. I would like to emphasize once more the importance of this type of operation, both to the aircraft operator and the manufacturer. (I see no reason why it should not be financially satisfactory to both.) When reviewing the rapid growth of cargo flying in the United States it can be argued that this is not an indication of what will happen elsewhere. With this I do not agree. It is true to say that here the great distances involved, all within one country's boundaries, the natural pressure of business that makes everyone feel that everything must be done in a hurry, the great productive ability, a wide geographic dispersal of population centres, all these give air freight a considerable initial advantage. This may be so, but it should also be remembered that air freight operators here are up against one of the best and most highly developed rail and road systems in the world. Despite this, air cargo is growing in the most astonishing fashion.

Let us look at the facts. During the latter part of the war, one or two DC-3 freight aircraft were in use, but it was not until after V.J. Day that things really got going. Since then the number of purely cargo aircraft has increased from one or two machines to over 100. The available cargo space has risen from 6,000 lb in 1942 to over 1,181,700 lb. During September, 1947, alone the air lines

American Newsletter . . . . .

and free-lance operators carried (exclusive of mail) over 14,500,000 ton-miles of freight, which is some 174,000,000 t.m. per annum. All this has been done despite the fact that this type of operation is in its infancy. No special aircraft are available. The best methods of cargo-handling are still to be worked out. The customers still have to be educated to send their products by air. Even the operators themselves, without properly trained personnel, proper ramps, suitable off-loading points and trucking tie-ins, are working through an experimental period which has already sent some of the smaller companies into bankruptcy. There have been accidents to both aircraft and to cargoes; perishable goods have gone bad (but not as often as you might think) and some of the all-weather equipment of the smaller non-scheduled lines has been anything but adequate. Yet the figures go on rising, and even if there are more flying accidents this winter, it will hardly affect the shippers of air freight, for the past winter shows that they are unaffected by such accidents. Developments up to the moment, therefore, indicate that what we need are aircraft specifically designed for the job, much better handling facilities, much better trained personnel and, through more experience, a better "cargo know-how." These will enable costs to be lowered with consequent increase in freight traffic. And if this can be done in an area of good ground facilities, think what can be done where surface transportation is bad!

So far as aircraft design is concerned, there seem to be only three new machines, either flying or in design, which have the purely commercial freight operator in mind. The Bristol Wayfarer, the Northrop Pioneer and the, as yet unbuilt, Curtiss CW-32. For comparison the published figures for these two latter aircraft are as follows:—

Northrop Pioneer (Flying)	*Curtiss CW-32 (Design only)*
A.U.W.—27,500 lb	106,450 lb
Weight capacity—7,500 lb	34,200 lb
Cubic capacity—1,640 cu ft	4,800 cu ft
Operating range—300 miles	1,300 miles
Block speed—150 m.p.h.	248 m.p.h.

Whether the Pioneer will go into production and whether the CW-32 will ever be built is something that remains to be seen. Both companies say they will not proceed until they get orders—a wise decision if the immediate bank balance is consulted—but I doubt its wisdom in the long run. As I am not a financier I naturally subscribe to the school of thought which believes that if an aircraft is built and it is good, then it will sell. But you can't sell a new type—particularly a new type for a semi-tried operation—off the drawing board. (And that is where they have fallen down over here on the feeder-line aircraft. They wouldn't build without orders, therefore there were no orders, therefore there are no feeder-line transports. But the demand quite obviously exists!)

The basic design of an all-cargo aircraft is also something which has to be carefully considered. Admittedly at this stage of the game we only know half the story, and there will be a lot of mistakes made, but from what we do know the following requirements seem to be necessary:—

The ideal thing would be to have a completely removable box fuselage, after the nature of that produced by Miles. One cargo operator went so far as to tell me that he didn't think freight carrying by air would really pay until that type of body—fuselage if you like—was available. In any case, ease of loading and unloading is of paramount importance, and this includes size and position of the door, its height above the ground, the height of the compartment, the method of segregating the load for the various stops *en route*, and the method of tying it down. Up to the moment, rope nets with steel tie-down rings seem to be the most satisfactory for securing the packages. Obviously an aircraft with a wide c.g. range is necessary, but the weight and balance requirements will always be a major problem. The floor should be strong, suitable for at least 200 lb per square foot, and smooth enough to be able to slide heavy goods about. Other points that would have to be taken care of in design would be ventilation, heating, pressurization, and refrigeration, although some experience in refrigeration here indicates that the pre-freezing of many of the foodstuffs, and the cold at high altitude, does eliminate the necessity for the latter requirement. (But what happens in the summer if the aircraft is grounded at, say, Phoenix, Arizona, for maintenance trouble when it has perishable goods on board, I tremble to think!)

As to the specification for aircraft performance I doubt if there is yet sufficient information to say exactly what is needed. But for certain types of overseas operation, a rapid take-off and slow landing speed will be necessary at the expense of high speed, and also a very rugged construction; an ideal that both the Wayfarer and Pioneer have tried for. For long-range domestic, trans-ocean and similar operations I would think that, as for the passenger transport, high utilization (and this must be obtained by rapid loading and unloading as well as high speed) would be the answer. I feel sure that a manufacturer who makes a suitable aircraft, and an operator who runs it, will not only make money but will do a considerable service to the country and the world. Moreover, the cargo class of aircraft may be the last and lingering hope for the retention of the reciprocating engine, and we may yet see the aircraft equivalent of Kipling's tramp-steamer wallowing along at 25,000 feet at a mere 300 m.p.h. while turbo-jet liners whistle past it!

THE STRATOJET FLIES

THE first large high-speed military aircraft to have a swept-back wing and tail surfaces, the Boeing XB-47, or Stratojet, to give it the manufacturer's registered name, made its first flight from Boeing Field, Seattle, on December 17th. Piloted by Robert Robbins, this six-jet bomber remained airborne for 52 minutes, during which time preliminary checks were made of "control approaches to stalling speed, unsymmetrical power conditions, operation of mechanical equipment, and general flight characteristics." All were declared to be satisfactory.

After take-off, and a preliminary control check, Robbins, and his co-pilot Scott Osler, climbed to 15,000ft over the Cascade Mountains, heading east, throttled the General Electric turbo jets and continued to climb to 16,000 feet. Having made further checks they made four "practice landings" at various speeds while over Eastern Washington, and came in to Moses Lake airfield, where continued tests will be conducted.

The XB-47 was designed to carry over ten tons of bombs and has a designed gross weight of 125,000 lb.

Though in normal flight condition the XB-47 is extremely clean, it appears unusually dirty with "everything down."

Application of

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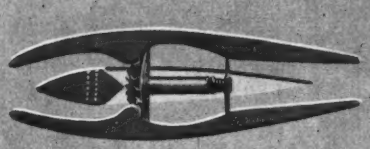
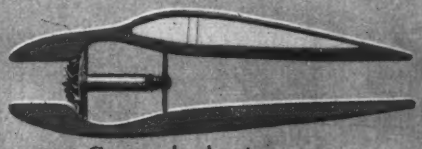
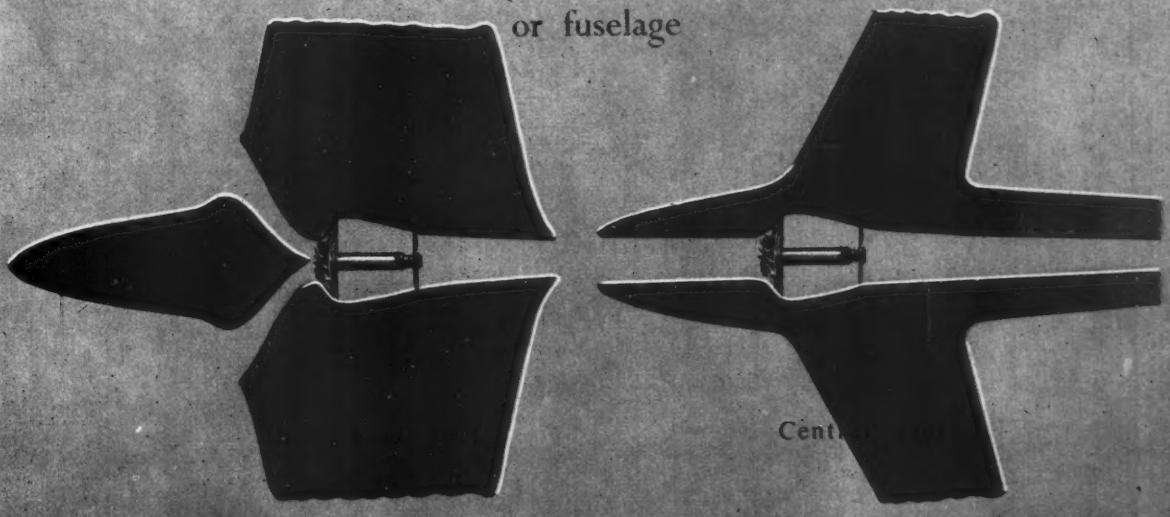


Bifurcated duct



Central duct

or fuselage



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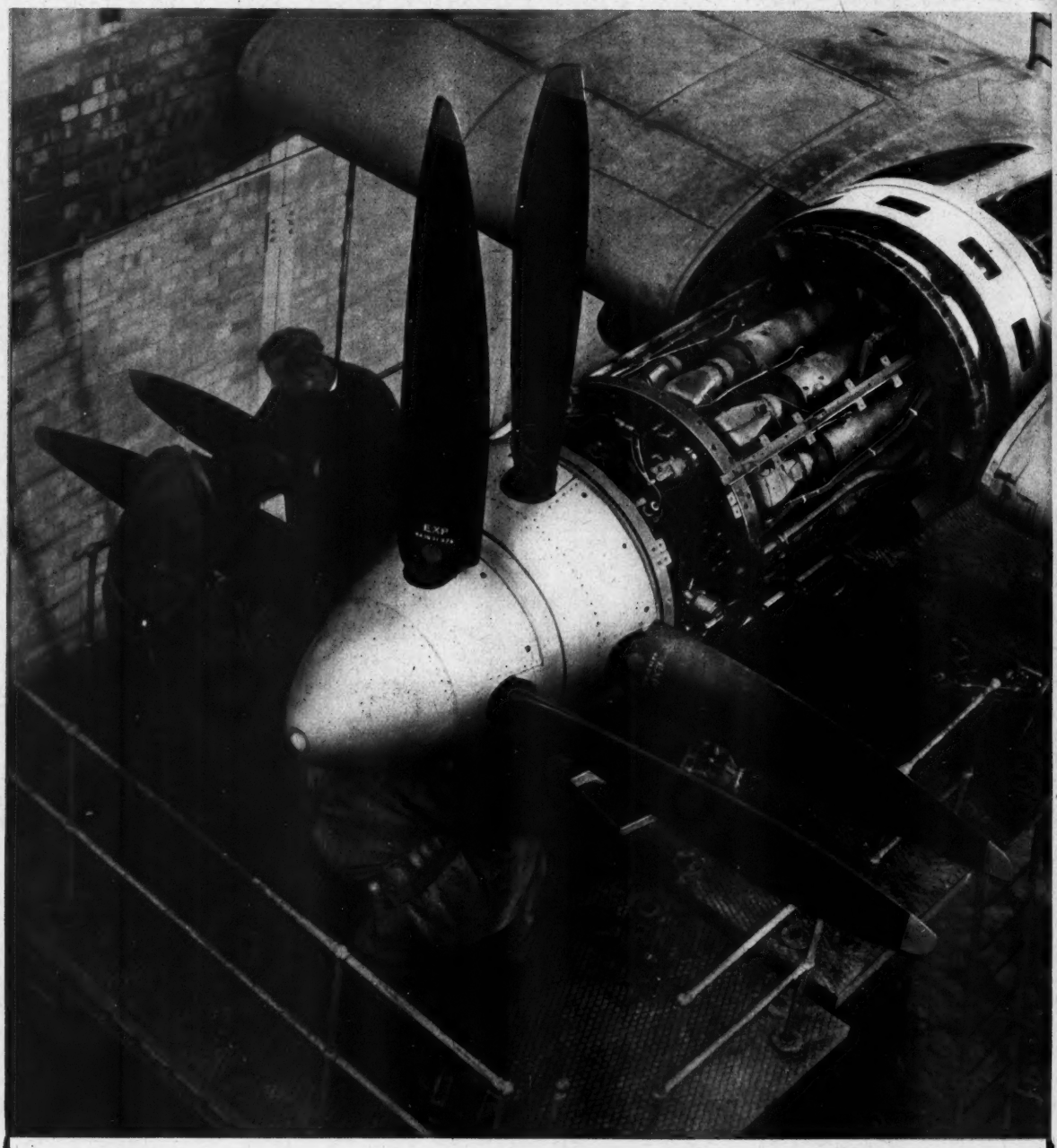

The installation of the Python provides excellent engine accessibility together with an intake of high efficiency, enabling the designer to take full advantage of the ram effect given by the propellers. Due to the intake position the problem of inhaling a large volume of air is satisfactorily overcome. The figure of 3,670 shaft horse power has already been reached by this engine and its high power weight ratio and low drag installation make it a very attractive proposition for the larger aircraft.

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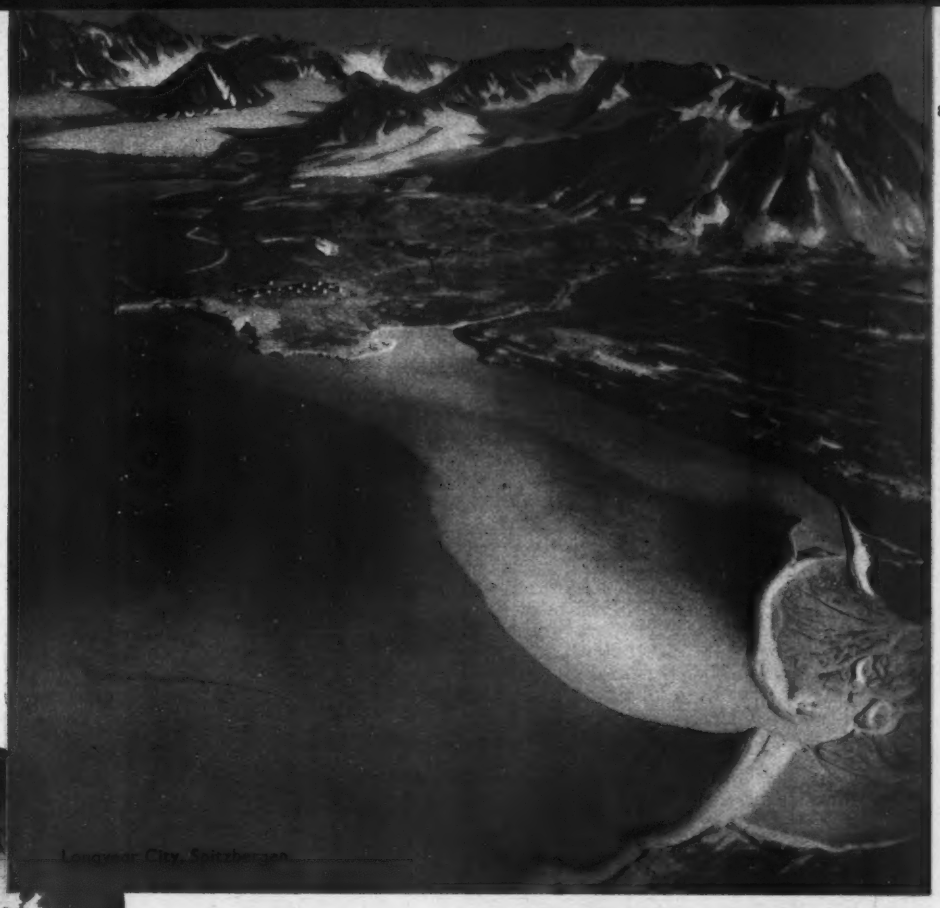


Longyear City, Spitzbergen

ARCTIC EMPIRES

Frank Illingworth describes a New World opened up by Air Transport

AIR transport is the foundation of the new polar empires now being built by the U.S.S.R., the United States and Canada. The main Alaskan and Yukon towns are linked by the famous Alaska and Richardson Highways; a narrow road crawls up the spine of Finland to Petsamo, the (now Russian) port on the edge of the Barents Sea; roads link the Soviet Arctic towns, Igarka and Kirovsk, grown in seventeen years from hamlets of 43 and 28 inhabitants to industrial centres of 23,000 and 40,000 people respectively; sea convoys pass through the fabulous North-East Passage and along the Soviet's Arctic seaboard; all this and much more has been accomplished in the Far North, but without freight planes the colonisation of the Arctic would still be far from fulfilment.

Aviation has transformed the industrial development of the polar regions from a painfully slow process to a startling realisation, if as yet only an immature realisation.

The Russians are shy about their success in Arctic colonisation. Foreign sailors are not permitted to join the summer convoys through the grinding floe-ice of the North-East Passage, eastern gateway to the new towns illuminated by arclights throughout the winter-long polar night; the "greenhouses" built in frozen earth; the vanadium mines; coal, copper, nickel and iron mines; the lumber mills powered by wind-generated electricity; the collective farms growing a species of wheat specially developed for planting in the Far North; and the chain of meteorological stations built to facilitate air communications.

Russians are shy about all this. But news travels fast and far, even in the Arctic, and it is reported that the Soviet's chain of weather stations stretches from the naval and air base of Petrovosk (on the Kamchatka Peninsula overlooking the Aleutian Islands in the North Pacific) all along the Soviet's Arctic shore to the desolate island of Nova Zemlaya (embedded in the Ice Barrier) and across the Polar Ocean to Barentsburg in Spitzbergen.

It is by no means certain that the last-mentioned Russian met. station will form part of the new chain of weather stations, including floating met. ships in the Atlantic, planned by PICAO (ICAO, now that the "Provisional" has been dropped). It is equally uncertain whether Atlantic air services will gain an advantage from the Russian robot met. stations planted on the sea-ice that drifts across the roof of the world from Siberian waters through the Kara Sea and across the North Pole to the Bering Straits (separating Siberia and Alaska).

Soviet Strategy

How many meteorological stations and air bases the Soviet has on the North Siberian coast is a matter for conjecture. But at least thirteen are reported to be as large as any in Alaska and Arctic Canada, excluding Goosebay; and Russia is now seeking to extend this chain to Spitzbergen, the Norwegian islands midway between Murmansk and Iceland.

Why should Moscow want to fortify this desolate archipelago?

One reason is that *Spitzbergen is only eight to ten hours' flying-time from Canada's uranium mines.* Another reason is the islands' strategical position in relation to American

Aries

ARCTIC EMPIRES . .

air bases in Iceland and Greenland, and its position overlooking the sea route to Murmansk, key to the Russian Arctic.

Spitzbergen's tundra, permanently frozen to a depth of 1,300 feet, is ideal for the construction of airfields. In winter its fjords offer landing strips for ski-planes, and in summer they would prove ideal for seaplane and flying-boat bases. In addition, they are deep enough to accommodate ships up to the size of destroyers.

When we steamed into Advent Bay, harbour to the Norwegian coal mining community of Longyear, we appeared to have reached the ultimate in desolation, for the little mining community was barely visible against mountains shoulder-high in ice-fields.

But the desolation was even more marked at Green Harbour (a harbour in name only), further up the coast towards the Ice Barrier. The only signs of civilisation were those of past failures in the utilisation of these islands—an old whaling station; the lonely grave of a sailor; a collection of Arctic equipment that originally belonged to a polar expedition; the wreck of a sealing vessel with flanks torn by the grinding action of winter ice floes; and the wreck of a meteorological station.

King's Bay confirms the conviction that Man's hold on the Arctic is uncertain.

This riven inlet was the starting point for the early race to reach the North Pole by air, beginning with the crazy notion of Andrée to balloon across the Pole (1887). I found on the flat, frozen tundra the great iron framework of the hangar erected for the Ellsworth-Amundsen flight across "The Great Ice" from Spitzbergen to Alaska. Amundsen used King's Bay for his polar flight of 1925; and it was the base for Admiral Richard Byrd's Arctic adventure, and for the ill-fated Nobile expedition. Littering the edge of the Bay are dozens of petrol tins and food crates used by the expedition that tried to reach Nobile's crashed airship 200 miles across the ice from Spitzbergen.

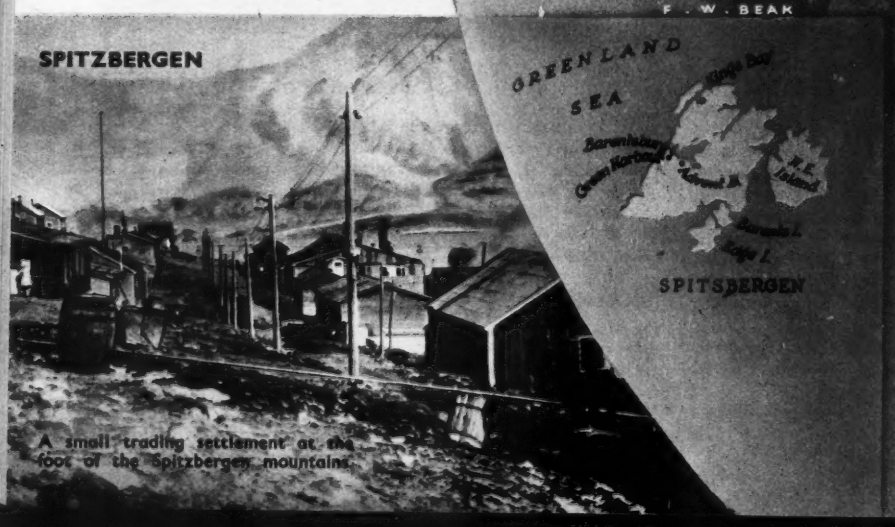
"God!" I thought to myself. "What desolation!" *and then it suddenly occurred to me that I was standing at an air crossroads of the not-so-distant future*; a "service-station" on the Moscow-to-New York air route, and a probable key-

THE TOP OF THE WORLD

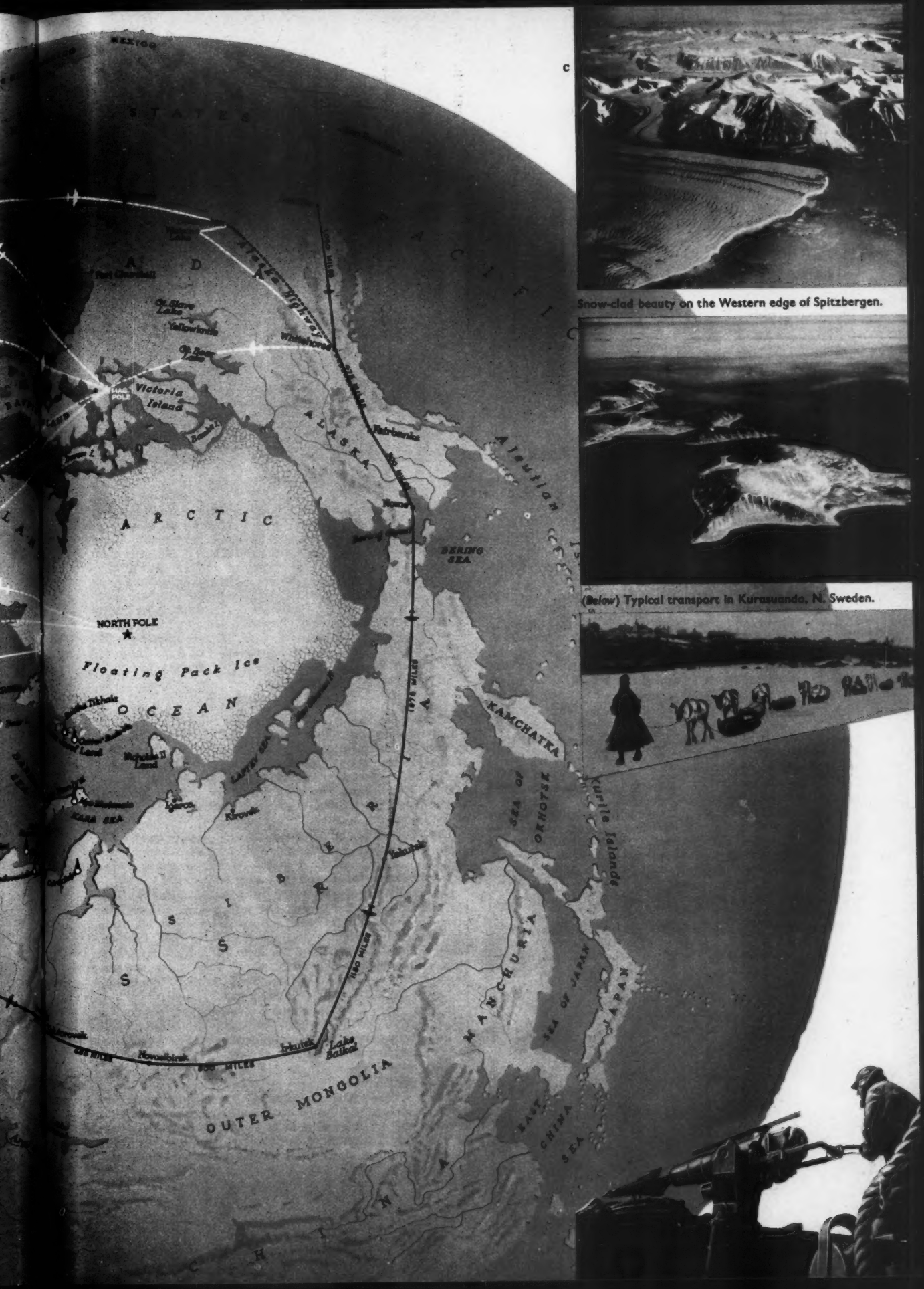
IN this specially drawn map our artist, F. W. Beak, illustrates the geographical proximities of which air transport has made us suddenly aware. In addition to the B.O.A.C. air routes from London and Prestwick to Gander, New York and Montreal, the famous Alaskan Highway and the Lease-Lend air route from U.S.A. to Moscow are indicated. The map also shows some of the most northerly of the international weather ships and of the known Russian meteorological stations.

The white dotted lines mark the ENAS flights made by the Lancaster *Aries* and described in *Flight*, December 5, 1946.

F. W. BEAK



A small trading settlement at the foot of the Spitzbergen mountains.



Snow-clad beauty on the Western edge of Spitzbergen.

(Below) Typical transport in Kurasuando, N. Sweden.

Midnight sun provides a picturesque setting for Horseman Island, North Norway.

ARCTIC EMPIRES . . .

point in the new conception of polar strategy.

Hardly is it surprising that the U.S.S.R. seeks to fortify this riven archipelago. A recent Moscow announcement said that Norway had agreed to the joint defence of Spitzbergen (which was forbidden by the 1920 Paris Treaty signed by twelve countries, and to which Russia adhered in 1925), adding that "negotiations with the other Powers on its future status are not completed." A subsequent Norwegian report said that fortification of the Russian mining concession at Barentsburg has begun.

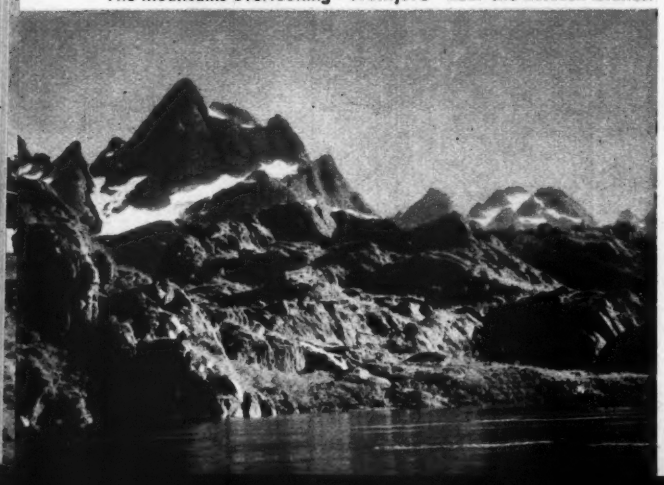
The 2,300 Russian miners there cut 500,000 tons of high-grade bunker-coal annually before the war. The loss of this coal was a serious matter to Murmansk and Archangel when the Germans occupied Spitzbergen; and the Russians cannot be criticised for trying to prevent a repetition of this episode in any future war.

What is the reason for the sudden military emphasis on the polar regions?

The answer is that the wings that made polar colonisation possible, also gave the Far North a military value; and Russian air, naval and military bases in the Far North are no more than the answer to the vast new military network now being created from Nome, on the Bering Straits opposite Siberia, right across the "Great Northlands" to Fort Churchill on the Hudson Bay, and beyond to Greenland and Iceland.

The Alaska Highway, built to link the airfields used to fly lease-lend aircraft to Siberia during the war, has become a "possible dagger pointed at the backdoor to Moscow." Constant American manœuvres in Alaska, the construction of new airfields along the Bering Straits and the extension of existing ones, and the practice-landing of military aircraft on "young ice"; these and many other developments must have a certain significance in Russian eyes. Likewise, no doubt, the Soviet saw a possible significance in the joint U.S.-Canadian Operation Muskox last year, in which aircraft, snow-vehicles and other equipment were tested in the Arctic; in the development of Fort Churchill into a military post, small as yet, but growing.

The mountains overlooking "Trollfjord" near the Lofoten Islands.



Trade or Defence?

The development of Fort Churchill typifies the way in which colonisation is followed by new strategical requirements. For decades Fort Churchill was a distant outpost of the Hudson's Bay Company, the home of fur trapper and trader. Aviation increased its commercial value, making it accessible even when winter ice locks its harbour, and to-day Churchill would prove important in the defence of the Canadian Arctic.

The Canadian gold-mining town, Yellowknife, has grown, in thirteen years, from two log cabins to a community of 3,000 people, and as it grows so it becomes a firmer link in the new Arctic strategy based on aircraft.

Did not the Russian chain of meteorological stations also begin with a purely commercial purpose? They were probably built with no other end in view than to maintain regular summer convoys through the North-East Passage. Likewise, at least some of the airfields in the same area were originally built for the aircraft that pilot the ice-breakers through the ice floes of the Passage. To-day they undoubtedly have a military significance.

In the same way the Canadian Arctic meteorological network, founded by the Hudson's Bay Company, plays an important part in sea communications and civil aviation, and would prove invaluable in warfare.

Lastly, these same meteorological stations and airfields are on the shortest route between Russia and North America, whether the objective is of a military nature or the air exchange of vodka for canned hamburgers. But for aviation the commercial development of the Arctic would still be only a dream of the modern pioneer. And the wings that made possible the colonisation of the Arctic by 1,500,000 people in twenty years has also given the tundra and the muskeg a military significance.

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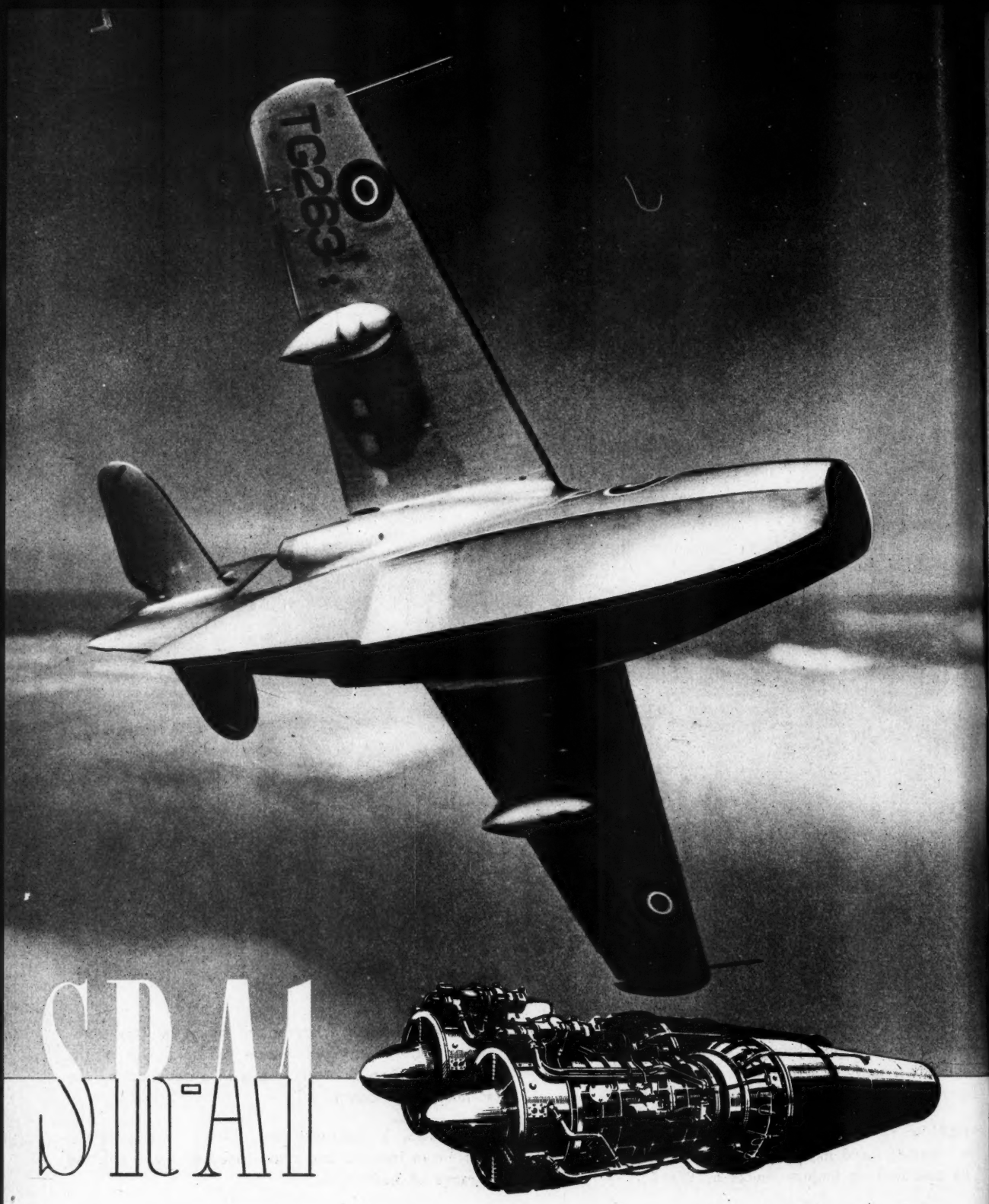

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"Ack-Ack" at War

General Pile's Despatch : Defence Against V Weapons

GENERAL SIR FREDERICK PILE, who commanded Anti-Aircraft Command from July 28th, 1939, until April 15th, 1945, tells, in his despatch dealing with the A.A. defence of the United Kingdom during that period of unsuccessful efforts to obtain permission to shoot at V-2 rockets. The despatch, published as a supplement to the *London Gazette*, says of these missiles with which South Eastern England was bombarded in the autumn of 1944 and early 1945, "I felt convinced that this was the beginning of one of the great problems of the future. On December 12th, 1944, I proposed that I should be allowed to try shooting at the rockets with a view to destroying them in the air. The idea of shooting at a shell was admittedly revolutionary, but there seemed to me to be no reason why it should not be anything more than a further development of the present unseen firing methods. My proposal was rejected as it was not considered that it had a theoretical background of success sufficient to justify the danger to the civil population beneath the barrage." When plotting of V-2s became greatly improved, he applied again for permission to fire. "If I had aimed at one of every two rockets descending and hit, as I estimated, one in thirty, the chances were within the limits I had been set, although as three in thirty already burst in the air, it would be some time before results could be proved. On March 28th, 1945, I gave orders to the guns to be ready to fire, but on March 27th the last rocket had fallen. On March 30th the Chiefs of Staff again refused permission for the guns to fire at rockets.

"The advance in the science of anti-aircraft defence since the beginning of the war has been prodigious," comments the General, "but I believe we are still only touching the fringe of future possibilities. Air defence is of such paramount importance that we must spare no effort and no expense to maintain our scientific lead."

Of measures to counter flying bomb attacks, General Pile says: "More was learned about the potentialities of anti-aircraft work in eighty days than had been learned in the previous thirty years." To fight the flying bombs guns were massed along the south-east coast as far north as Great Yarmouth, and it was decided to build winter quarters for the batteries—including mixed batteries whose A.T.S. members refused to leave for more comfortable camps. This £2,000,000 project involved building sixty miles of road, 3,500 huts, laying 150,000 tons of rubble and hardcore as foundation, and was equivalent to building a town the size of Windsor. The building trade estimated it would take six months to complete, but 1,800 men in construction batteries, with 7,500 unskilled helpers from other units, did it in two and a half months. Initial deployment of gun defences against V-1s was completed in a week, instead of the eighteen days originally estimated to be necessary.

At the outbreak of war General Pile had only 695 guns, many of them obsolescent, against an approved total of 2,232. Light guns numbered 253 out of an approved total of 1,200. There were 2,700 searchlights instead of 4,128. By May, 1941, guns totalled 1,691 and 940, and searchlights some 4,000. In June, 1940, at the beginning of the flying bomb attacks there were 2,635 heavy guns, 4,589 light guns. Rocket projectors, introduced in the meantime, numbered 6,372 at the end of 1943, and radar had come in as a new and telling factor. General Pile describes the 106,690 Territorials who manned our entire A.A. defences in 1939 as "the cream of the manhood of the country."

SUPER BOXCARS

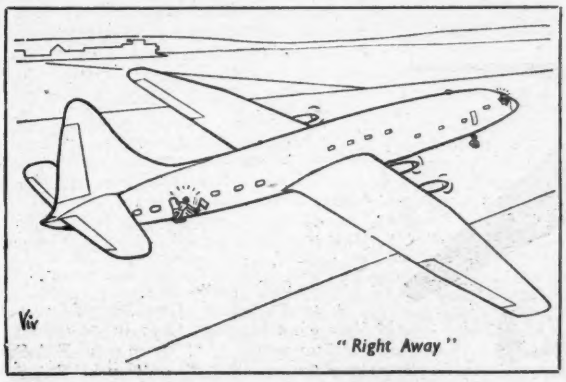
AN order, approximating twenty-two million dollars, has been placed by the United States Army Air Force, for thirty-seven Fairchild C-119 Packets, or "Flying Boxcars," developed from the C-82. Two 28-cylinder four-row Pratt and Whitney Wasp Major engines, each delivering 3,250 h.p. for take-off, are installed, permitting a maximum take-off weight of 74,000 lb. The C-119 will carry 42 paratroopers in addition to 20 "paracans" of supplies, which are suspended from an automatic overhead monorail. Superficially, the C-119 differs from its predecessor in the configuration of the nose section, which has been redesigned to allow a better field of view for the pilot during formation flying. Windows have been added to provide outward visibility during the delivery of paratroops and parachuted supplies.

ARCTIC SHOOTING STARS

A SQUADRON of Lockheed P-80B Shooting Star jet fighters has lately arrived at Ladd Field, Fairbanks, Alaska, for the first mass tactical operation of jet aircraft under Arctic conditions. Extensive modifications have been made so that the machines can be operated in temperatures as low as −65 degrees Fahr. The turbo-jet units have been adapted for starting with petrol, before being switched to kerosene for normal running. New greases are being tried, hydraulic units have special packing, and auxiliary electric blowers are installed to assist in defrosting windscreens and canopies. Synthetic rubber, which becomes brittle in extreme cold, is being replaced throughout by natural rubber, particularly in the sealing of the pressurized cockpit.

Present plans call for a six months' stay in the Arctic, which period, according to the U.S. Army Air Force, "will provide an excellent study of the cold-weather behaviour of single-compressor jet engines."

The Lockheed P-80B is essentially similar to earlier models of the Shooting Star but has improved armament and is stated to be more resistant to battle damage. An order for over 130 P-80Bs is now being executed by Lockheed at Burbank, California, to supplement the P-80As already in service.



"Right Away"

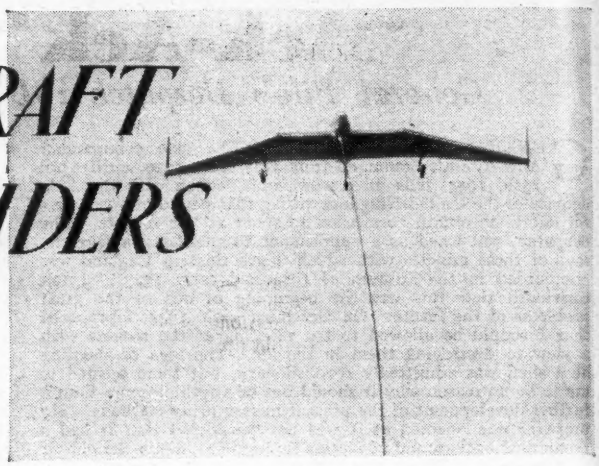
PERCIVAL PROJECTS AND PROGENCY

A FEW months ago the chief designer of Percival Aircraft, Ltd., Mr. Bage, was asked if the Percival P.50 Prince was, in fact the company's 50th design. He believed it was, and in answer had prepared a list of all Percival aircraft since the P.1 of 1932. This first machine was the Gull Four Mk I three-seat, low-wing monoplane with Cirrus Hermes IV engine. The P.2 was the first Mew Gull built in 1933 as a racing monoplane with Javelin 1A engine. The P.3 was the first Gull "Six" cabin three-seater built in 1934. The P.4, 5, 8 and 9 of 1935 only reached the design stage and were respectively an 8/10-seater, low-wing twin, a single-engine, light pusher, a single-seat, low-wing monoplane, and an 8-seat, twin-engine forerunner of the Q.6.

The first Gipsy Six Mew Gull II racing monoplane of the same year was the P.6, and the P.7 was an open-cockpit Gull variant. P.10 to 15 and P.20 were various versions of the Vega Gull, including a light bomber project for the Chinese. P.16 was the Q.4 and P.17 and 18 Q.6s. P.19, 21, 22, 23, 24, 25, 26 and 27 were designs varying from a four-engine, high-wing monoplane (19) and a two-seat tandem elementary trainer (21), to a high-speed target aircraft (22) and a twin-engined amphibian (27). An airframe for testing large engines (26) was also included.

Various early marks of Proctor take up P.28, 29, 30, 31, 34, and later Proctor variants of 1944 and onwards are the 43 (Peewit), 44 (Mk V), 45, 46, 47 (Mk VI). The P.41 and 42 were twin-engined projects designed to meet Brabazon Spec. 5A, the 48 is the Merganser land, float or skiplane, and the 49, of 1947, a Mk II Merganser for survey work. The Prince is thus the P.50.

GENERAL AIRCRAFT RESEARCH GLIDERS

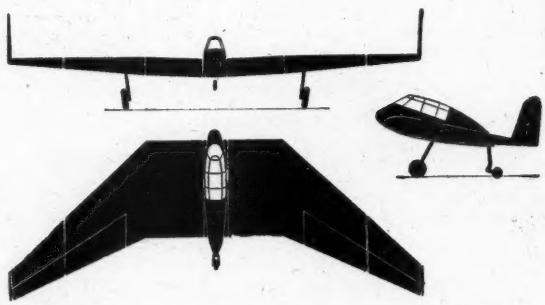


Principal Features of "Medium V," "Medium U" and "Maximum V" Designs

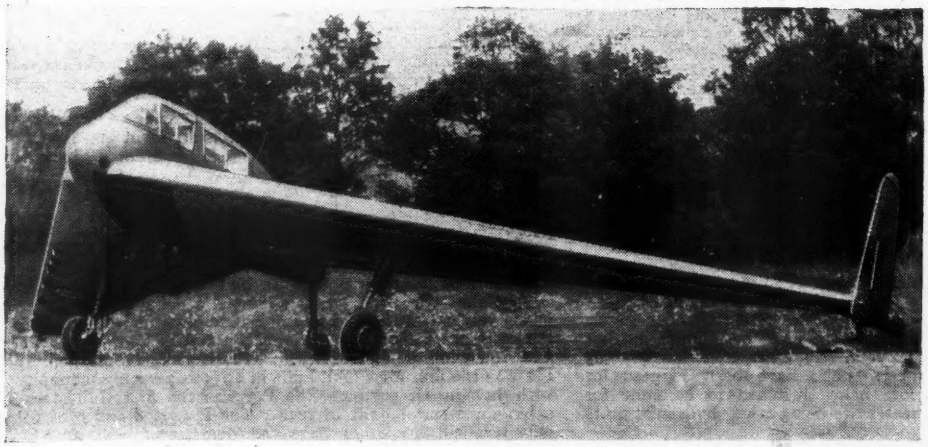
TO the student of aerodynamic design one of the most absorbing exhibits at Radlett this year was the "flight" of three experimental towed gliders, all tailless, but having wings of differing planforms. These instruments of research have been built by General Aircraft Ltd., of Feltham, Middlesex, as part of a Ministry of Supply programme. One—known as the "medium U"—was demonstrated by Mr. R. Kronfeld, after being towed off by a Halifax.

On this page are general arrangement drawings of the three gliders. The "medium V" type has a 28.4 degree sweepback, measures 45ft 4in in span, is 19ft long and 8ft 9in high and is numbered TS507A. It is a normal glider and was described in some detail in *Flight* of September 26th, 1946. The "medium U" has the same degree of sweepback, is numbered TS510D and has rotatable wing tips. Span length and height are respectively 51ft, 21ft and 10ft. A nose flap arrangement is incorporated in the "maximum V" (TS513B), the corresponding dimensions of which are 45ft 4in, 23ft 6in and 9ft. Other data for the "medium V" are:—

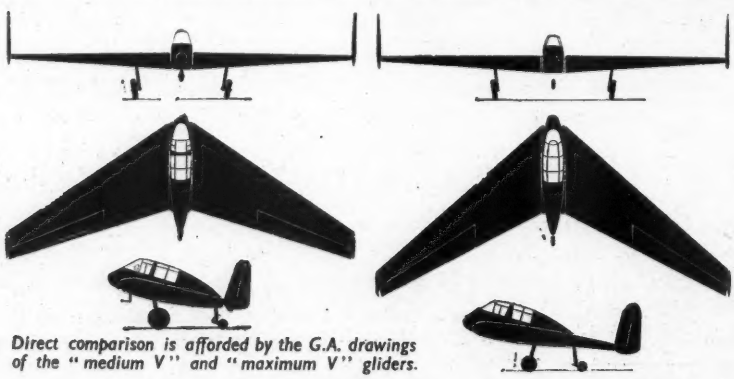
Wing area (net)	317 sq ft
Wing area (gross)	350 sq ft
Aspect ratio	5.8
Aerofoil section	Raf 34 modified
Chord—root	11ft 4in
Chord—tip	43.58in
Dihedral—normal	0.5 deg
Flying weight with two crew + max ballast	4,400 lb
Max wing loading	12.57 lb/sq ft
Stalling speed	58 m.p.h. E.A.S.
Max towing speed	150 m.p.h. E.A.S.



In the heading picture the "medium U" is seen from the towing Halifax. A general-arrangement drawing of this version also appears above.



The angle from which the "maximum V" is seen on the left gives a true impression of the sweep-back. This version, which has a span of 45ft 4in, incorporates a nose flap arrangement.



Direct comparison is afforded by the G.A. drawings of the "medium V" and "maximum V" gliders.

OXYGEN for PASSENGERS

Details of New Developments for Oxygen Supply in Civil Aircraft

IN the recommendations for standards, practices, and procedures dealing with international air service operations (Ops) issued by P.I.C.A.O. in May, 1946, article VII of section 8 in chapter IV states that "Oxygen supply necessary for adequate protection of crew and passengers shall be available on those operations involving regular or accepted operations with a cabin pressure less than that equivalent to 10,000ft (3,048 metres). An adequate emergency supply of oxygen shall also be available for the use of the flight crew on all regular or accepted operations at an altitude above 10,000ft whether or not the cabin is pressurized." It is with the first half of this recommendation that we are here concerned, for it raises an issue that, so far at least, has been sidestepped.

Oxygenaire (London), Ltd., is a company whose name is better known in the world of medicine than in that of aviation. Being specialists in a specialized field, they are able to approach this particular problem of oxygen provision with all the advantages attendant upon such specialization.

Although one is apt to associate the term "passenger" only with adult persons, it does, in fact, embrace travellers of all ages and it is patent that the means whereby the oxygen is administered must be physically appropriate to the user. Part of this problem is fairly simply solved by provision of suitable oxygen masks, and the new "Oxyair" face mask is a great advance on anything of a similar nature that we have yet seen. The second part of the problem—that is, administering oxygen to babies—is by no means so simple of solution; however, Oxygenaire have tackled the problem with considerable imagination, and the real ingenuity of their solution tends to be obscured by its extreme simplicity. The intention is that the baby passenger shall be supplied with oxygen whilst lying in a special cot, but the part of this scheme which is of such outstanding interest is that the child is not enclosed in the cot; it simply lies there as in its own cot at home.

Masking Advances

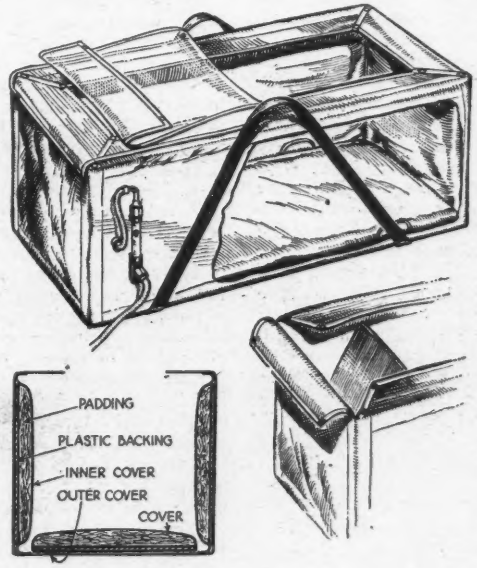
The "Oxyair" face mask is a great contrast to the wartime Service mask. The airline passenger is to be given a thin, translucent, moulded plastic mask of negligible weight; this can be worn for considerable periods without discomfort, and it does not interfere with the wearing of spectacles, nor do the reservoir bag or the small-bore tube for oxygen supply interfere unduly with the wearer's movement.

The mask is of the re-breathing, reservoir type, a continuous supply of oxygen being fed via the small-bore tube into the reservoir bag from the supply point adjacent to the passenger's seat. During inspiration, air is drawn in through a gauze-covered ventilation hole in the front of the mask after the oxygen in the bag has been exhausted.

During expiration the relatively uncontaminated proportion of the expired breath re-enters the bag, and the remainder is expired through the ventilation hole. The gauze-covered hole—careful design and positioning of which allows the wearer to carry on conversation—provides a minimum resistance to breathing and also creates a turbulence which is an advantage at high respiratory flows; additionally, the reservoir bag has the advantage of being self-collapsible and, due to the extreme thinness of its walls, is particularly sensitive to small changes in pressure.

The connection of the reservoir bag to the mask, together with the positioning and shape of the inlet tube, have been so designed as to avoid any possibility of accidental closure of the neck of the reservoir bag. Furthermore, the low resistance of the ventilation hole ensures that an adequate supply of air will reach the wearer should a temporary, short-duration interruption occur in the oxygen supply. The face mask is completely free from odour and taste and, due to the inert nature of the plastic material of which it is made, will not cause irritation. The ancillary items are easily detachable and this, together with the smooth finish of the mask and its freedom from cavities, facilitates sterilization by washing in antiseptic solutions; the mask should not, however, be boiled. Although the basic design of the mask is such that it should be capable of snugly fitting a very much larger proportion of faces than is normally the case, it has been decided that production masks should be in large, medium and small sizes to give the widest possible application.

The "Oxyair" face mask, showing the elastic single-strap attachment.



The open-topped "Oxycot" for baby passengers.

Cot Construction

The "Oxycot" is designed to accommodate any child which can comfortably lie in a Karrikot, the dimensions of the former (32in × 14in × 14in) being substantially similar to those of the latter. As shown in our detail sketch, the "Oxycot" is constructed with plastic side- and end-plates, padded with a soft, cellular wadding, and covered inside and out with a non-inflammable, gas-proof plastic material which is not cold to the touch; the mattress is entirely similar in construction and is detachable. Sides and ends are arranged to fold inward so that stowage is facilitated, the thickness for this purpose being of the order of 3in. The weight is approximately 4½ lb.

The reason why a baby can be supplied with oxygen in the cot without any enclosing cover is, of course, that oxygen is heavier than air. Thus, so long as the child's head is below the level of the top of the cot, oxygen fed into the cot will fill it and then spill over the sides. There is no question of over-supplying the child with oxygen, for the human body will absorb only the amount of oxygen it actually requires; thus it is that, although the normal human requires an average oxygen concentration of 21 per cent by volume, he can breathe quite comfortably without ill effect in an atmosphere with a 50, 60 or 70 per cent oxygen content—the blood will accommodate its requirement from the 21 per cent oxygen concentration and will reject the rest.

Oxygen supply to the cot can be through a bobbin-type flowmeter carried in loop slings at the side and calibrated in litres/minute. By this means the mother can see that her child is obtaining oxygen, and the stewardess can make a simple check that the flow is of the required order. (The average oxygen

Oxygen for Passengers . . . . .

flow used by airlines is 2-3 litres/minute.) In this connection it is assumed that stewardesses will be trained in the use of these cots, etc.

Although the "Oxycot" is designed for use in an open state, a cellophane cover is provided which, fastened with press studs, can be used as a means of draught exclusion should this be necessary. It is not likely that the normal flow of ventilation air inside an aircraft cabin will be such as to give a draught of sufficient strength to incur a loss of oxygen from the cot by "scooping," but the possibility does exist and the cellophane cover is a means of combating this: it also serves as a protection for the infant when being carried out to the aircraft in inclement weather. The cover is not a tight fit—there is ample room between the press studs—and, in the event of failure of the oxygen supply, the vitiated air (being considerably lighter) can rise to the top and escape whilst the oxygen content inside the cot should be enough for the child for a period of about an hour. There is, of course, no question of an aircraft having to remain at "oxygen height" for an hour without oxygen supply.

Oxygenaire, Ltd., intend that the "Oxyair" mask should be a purchasable commodity, whilst the "Oxycot" should be either purchasable or hireable, but preferably the latter since this permits periodical servicing by specialists. The "Oxycot" is at present undergoing test by B.O.A.C.

Safety First

How "Hot-Stuffing" can Ruin the Smooth Running of an Airline

By Captain T. NEVILLE STACK, A.F.C.

THE public at large, and for that matter the non-technical and non-operational types in air transport companies, do not and cannot appreciate the amount of detail work and inspection, not to mention the odd test flights, that have to be carried out before an aircraft is considered satisfactory to undertake a flight, in particular a long-distance one.

An aircraft is an extremely temperamental thing. I have known them perfectly serviceable an hour before take-off, and upon taxying-out some trouble developed. Not only this; they have also a propensity for developing some snag even whilst standing and waiting. The Royal Air Force attribute this to "*Gremlins.*"

Therefore the greatest care and minutest detail inspection is constantly necessary. These things cannot be done efficiently in five minutes—a rushed job is usually a botched job, with the result that something is overlooked.

It is essential that those who maintain aircraft in operating companies should be *intimately conversant* with the type being operated, and should know exactly where to place their hand on the cause of the trouble, and where to keep an eye on any weak spots where trouble is likely to develop in the whole box of tricks.

This can only be done by the right type of maintenance engineers and inspectors, who must be men engaged the whole time on the work and experienced in tracing faults quickly, and in rectifying them without delay.

Men engaged on factory routine cannot compare with the maintenance mechanic in this respect. They can take their time—and do.

Maintenance engineers must work quickly and at all hours. Air transportation is a 24-hour job, and only the best and most willing mechanics, with a pride in their calling and in the reputation of the company, are worth while employing. They are few and far between.

Safety.—The safety and successful undertaking of an air journey depends upon many factors the chief of which can be detailed as under:—

1. Good inspection and maintenance.
2. Competent operations department and aircrews.
3. Careful briefing and flight planning.
4. Caution in regard to weather.
5. Attention to correct loading of the aircraft.

Number 1 is covered by the technical and maintenance staff but can be upset by unreasonable demands being made upon it, forcing and rushing unnecessarily the work to be done.

Numbers 2, 3 and 4 are covered by operations departments and attention to detail by aircrews.

Number 5 is covered by traffic handling departments and captains of aircraft.

Hot-stuffing.—What can upset the smooth running of an organization such as that outlined?

The first and most common is "hot stuffing." It usually starts with a couple of disgruntled or impatient passengers, frequently the loud-mouthed and least intelligent and imaginative ones.

The cause may be a delay due to weather or to some unforeseen snag having arisen (*Gremlins* again)!

They communicate their impatience to everyone else and also to the traffic staff. If it is a maintenance snag, the traffic staff start "hot-stuffing" the maintenance department, who in their turn, due to haste, may overlook something that could well cause delay on route or a return after take-off.—"More haste less speed."

If it is weather, they get at the captain and by devious ways endeavour to make him take off against his better judgment. They all know more than the pilot. One can quite well understand, and sympathize with, passengers in their delay, but better a day late than never to arrive.

Loading.—The loading of the aircraft must be correctly done and not in a haphazard manner. Overloading must be avoided, balance must be maintained and the aircraft loaded in conformity with limits of the travel of centre of gravity, otherwise the aircraft may be made unstable and, under certain conditions, become dangerous.

Therefore loading cannot be hastened nor cargo thrown in as into a railway truck or waggon.

Petrol Load as Against Pay Load.—Under this heading arises a point worth noting.

I have heard of cases when petrol has been off-loaded in order to put on more payload, leaving the aircraft with the barest minimum of fuel to reach its destination.

This, in my opinion, is criminal and, in the event of a head wind springing up or diversion due to bad weather, gives little or no chance to the captain.

Fuel Load.—It has always been my practice to allow for 25 per cent fuel reserve and a minimum head wind of 10 m.p.h. under normal conditions. This allows for most eventualities and diversions. No aircraft should leave the ground unless everyone concerned, ground crew and aircrew are content and confident. There should be no doubts.

Why is it that B.O.A.C., B.E.A., and Aer Lingus have such a splendid record of safety?

1. Excellent maintenance, good inspection and rectifications thoroughly and speedily but not hastily done.
2. First-class, experienced aircrews.
3. No hesitation in cancelling or delaying on account of weather or minor snags arising.
4. Ample reserve fuel for the leg of the journey to be accomplished.

Providing these things are carried out conscientiously and efficiently, and without that last-minute panic which invariably arises from "hot-stuffing," nothing need be forgotten nor left undone. Then risk of accidents would be brought down to the very minimum.

Cut out "hot-stuffing," "forcing-on regardless" and "cutting reserve fuel," then all will get to the other end in one piece.

PER ARDUA AD ASTRA.

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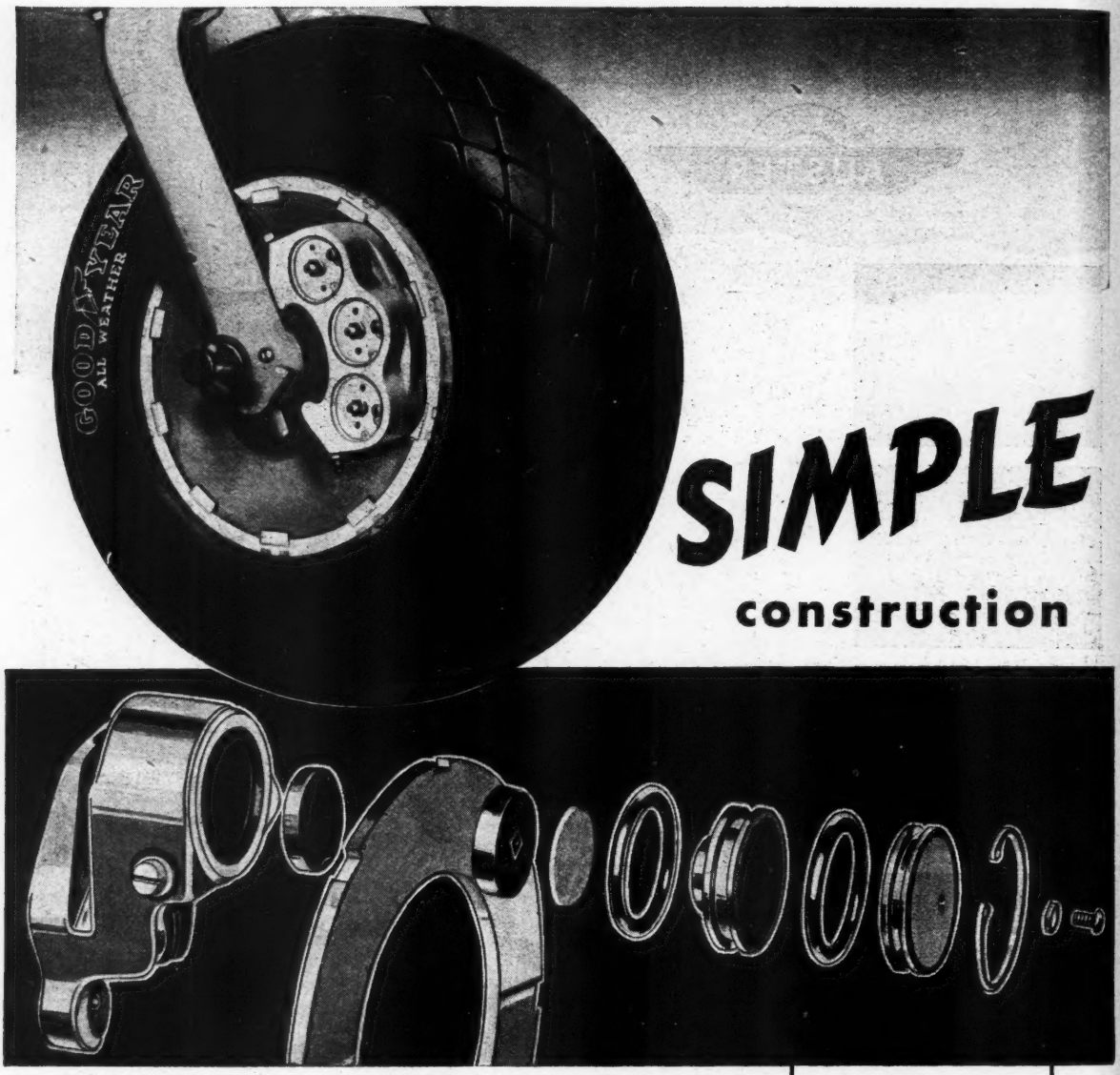


SIMPLE construction

Goodyear single-disc brakes

The simple construction of the Goodyear Single-Disc Brake gives manufacturers the advantages they require: maximum reliability and freedom from any but routine inspections. A self-adjusting device maintains lining clearance automatically, cool-running ensures minimum heat build-up in tyres, and weight-saving is achieved by perfect blending of design and materials. Goodyear's experience of Aviation Products has packed the features aviation men want into a brake which is leader in its field.

Displayed above is an "exploded" view of the Brake, showing linings, rings and washers. Nothing could be simpler than the Goodyear Single-Disc Brake. And nothing in its field is more efficient and reliable.

GOODYEAR
FACTORY AT WOLVERHAMPTON

AVIATION PRODUCTS

CIVIL AVIATION NEWS

OLLEY SPECIAL: The second Dove to be delivered to Olley Air Services is an "executive travel" model having six seats. The first delivered was a normal eight-seater as will be the other four on order. Since June, 1946, the company has flown well over 850,000 miles involving 2,500 flights.

The Ambassador Order : Italian Airline Sale : Pakistan Air Policy

The B.E.A.C. Balance Sheet

BRITISH EUROPEAN AIRWAYS' Annual Report and Statement of Accounts is the first of the three to be published. The total deficiency on the operating account is £2,094,939. In addition the surplus and deficiency account with provision for losses of associated companies brings the total deficiency up to £2,157,937. As stated in the Report the deficits are substantial but should be judged in their proper perspective in order to make appropriate deductions and apply suitable remedies. In a review of the operating conditions, attention is drawn to the difficulties encountered in the course of transformation of civil aviation from a wartime organization ancillary to the R.A.F. to the establishment of a peacetime organization. It was necessary to recruit aircrew, and since the Corporation had to start from scratch, arrangements had to be made for their immediate training in the different standards and techniques required for civil operations. The aircraft situation was such that the Dakotas were handicapped by an insufficiency of spares which rendered a fleet unserviceability varying from 8 to 24 per cent. The withdrawal from operations of the Viking, owing to instability in icing conditions, lasted from December 8th, 1946, until March 31st, 1947, resulting in the loss of four months' flying experience with the type under actual operating conditions as well as of considerable revenue. The remainder of the fleet consisted of aircraft taken from the A.A.J.C. group and included Dominies, Avro XIXs, Junkers Ju.52s together with a few Dakotas. The Ju.52s were uneconomical in operation and involved technical difficulties due to the stock of spares being made from sub-standard material.

B.E.A. was handicapped at home and abroad by delays in the provision of adequate ground facilities. Whilst appreciating the assistance of the M.C.A., there had been three root causes of operational disorganization, and the checking of forward planning. At most airfields the buildings were inadequate and unsuitable, especially at Northolt where no adequate hangar lighting and heating were installed in time for last winter and night maintenance was impossible. The booking and handling of passengers in Airways Terminal, London, which was not designed to cope with the volume of traffic of the two Corporations, had resulted in serious overcrowding and confusion in booking arrangements and so caused a loss in revenue. Another site had been leased but repeated unsuccessful efforts to have the property derequisitioned had necessitated the acquisition of yet additional accommodation. In the absence of suitable radio navigational and blind-approach aids throughout Europe, three out of every ten Continental services had been cancelled during the severe winter weather and the extra fuel loads carried as a safeguard in the event of diversions had restricted payloads.

Future Prospects

In planning the organization of B.E.A. it had been anticipated that civil aviation in Europe would undergo a period of rapid expansion. The slow economic recovery at home and abroad, currency restrictions on foreign travel, and the limitations on the import of goods had necessitated a revision of plan, however, and the immediate aim was now to eliminate those operations which held no hope of financial success, at the same time keeping the organization efficient and flexible so that advantage could be taken immediately of any improvement in trade conditions. Of the internal services, which were largely seasonal, the review covered only two winter months, February and March, 1947, and was not therefore indicative of a full year's result. The fare structure was below that of the Continental services, according to the Report, and in addition they were under the handicap of high landing fees and the payment of full excess duty without rebate on fuel and oil. Future internal services would therefore be confined to those which are likely to prove economic or provide a special public requirement. The Corporation had maintained the policy of safety as the overriding consideration—and would continue to do so. In conclusion the Report emphasized that special importance had been attached to the creation of an efficient organization to place in the forefront British civil aviation in Europe, realizing at the same time that large expenditure and relatively small returns would be necessary in the initial stages.

Particular attention was drawn to the fundamental part which must be played by ground organization at home and abroad in the realization of economic operations, the implementation of the majority of which are outside the control of

Civil Aviation News . . .

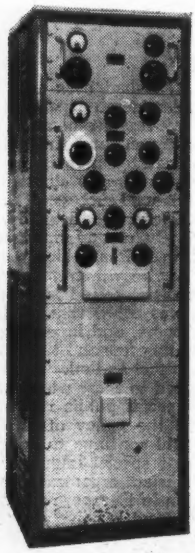
the Corporation. Appreciation was expressed of the aircrews and personnel of B.E.A., and a special tribute was paid to the former chairman and deputy chairman, Sir Harold Hartley and Mr. Whitney Straight. The Report, which contains operating and traffic statistics for the period, will be discussed in the House of Commons during the next session.

B.E.A. REPLACEMENTS

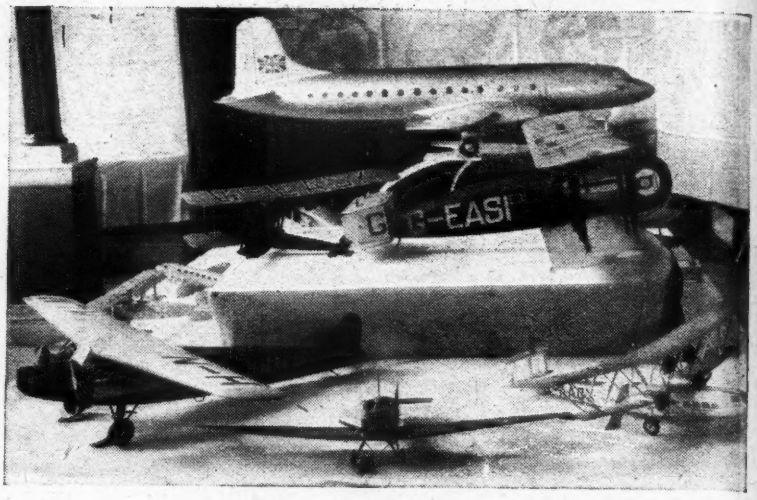
THE reversal of policy in the British European Airways Corporation in ordering Airspeed Ambassadors as a replacement aircraft for the Continental routes may be accounted for officially by the unexpectedly slow development of civil aviation on the Continent. Radio aids and Air Traffic Control in the British Corporation's sphere of operations have not developed as was anticipated about a year ago, and the prospects for early development are disappointing. Under such adverse conditions aircraft are forced to operate at low altitudes (below 10,000 feet) for considerable periods, and moreover in the absence of good air traffic control an unduly large reserve of fuel is necessary to safeguard against the danger of long periods of waiting to land.

Diversionary airfields in many areas in Europe are at considerable distances from the main airports and there is little hope of the immediate construction of new airfields. The result is that, since turbine-powered aircraft operate economically only at heights which are certainly above the perpendicular control limit on the Continent, there would always be, at the destination end of each journey, an uneconomically early entry into the Control Zone. Also, in order to operate economically such aircraft must climb as quickly as possible to the economical cruising height and descend at an appropriately steep angle at destination. Even more important, perhaps, is the problem of the safety reserve of fuel, since an aircraft powered with airscrew turbines would use in 15 minutes' orbiting at 3,000ft the equivalent amount of fuel which would be used to fly about 100 nautical miles in normal cruising flight.

Accordingly, B.E.A. has deferred the introduction of turbine aircraft and intends to develop the Ambassador with the Centaurus piston engine for economic operation over Europe in competition with the airlines who will be using the Convair 240. At this stage it would be pertinent to ask the Corporation's intentions for a replacement on the internal lines. The Marathan situation appears to be undecided, but the decision is presumably out of the hands of the Corporation in the Miles Aircraft Company's predicament. A new aircraft to take the place of the Rapide is an urgent requirement, however, especially as the Corporation has declared that the D.H.89 can no longer be run economically. An aircraft capable of carrying about 16 passengers and of taking off and landing in short distances is necessary. Although de Havillands would, perhaps, be the logical designers for such a replacement, it has been suggested, and with some enthusiasm from the pilots, that the Miles Merchantman would be suitable. This aircraft could be used on regular services to the Islands and on internal routes throughout the U.K., and it has a capacity to carry 20 passengers and their baggage. It would be interesting to know whether B.E.A. has considered the Merchantman, since it would be more economical to put into service an aircraft already designed than repeat some of our previous errors and waste time and energy in new designs, some of which may never be used.



The Rediffusion G.54 medium-wave transmitter.



EVOLUTION: Models at the Royal Geographical Society's exhibition, "Highways of the Air," in Kensington. They are (top) a Hermes IV; G-EASK, Westland Limousine; on the plinth, Vickers Vimy Commercial and H.P. 0/400; left (small models) a DC-2 and a Portuguese Fairey IIID; bottom row (l. to r.) a K.L.M. Fokker, a JU F13 and H.P. 42 "Hannibal."

AIRLINE FOR SALE

AN Italian airline, Trans-Adriatico, operating DC-3 services from Venice to major Italian cities, is for sale through an English firm of brokers and shipping agents, E. A. Gibson & Co., Ltd., of Cunard House, Leadenhall Street, London, E.C.3. *Flight* understands that the sale will probably be in dollars and that the former Trans-Adriatico interests will be converted to shipping. Reports state that Trans-Adriatico operates some DC-4 aircraft, a type which is not, as far as is known, operated by any other Italian-owned airline, although TESEO, Florence, has been seeking to charter DC-4s from American sources. After Alitalia, in which B.E.A. has interests, and L.A.I., with T.W.A. participation, TESEO is the largest Italian operator.

MEDIUM-WAVE TRANSMITTER

A MEDIUM-WAVE transmitter designed to meet M.C.A. requirements has been introduced by Rediffusion, Ltd., Broomhill Road, Wandsworth, London, S.W.18. Known as the G.54 model, it can be used for telegraphy and telephony on ground-to-air communications or as an M.F. radio navigation beacon. Power is taken from an A.C. mains supply; the output to the aerial circuit on C.W. is 100W and carrier power on M.C.W. or telephony is 80W, the frequency range being 250-500 kc in two bands. It is crystal-stabilized, stability being maintained within 0.02 per cent throughout the range, but an electron-coupled oscillator which has a stability of 0.1 per cent is also provided. When used in an "American zone," the G.54 can be adapted to an alternative frequency range of 200-415 kc.

The transmitter consists of four units: power, modulator, R.F. and aerial coupling, mounted in separate draw-out units in a steel rack assembly in a cabinet. A blank panel is provided for the fitting of an automatic code-sender if required, and another feature is fully tropicalized finish and components. The code-sender provides a two- or three-letter call sign, followed by a long dash. The transmitter may be operated from a desk unit located up to 5 miles away, and this remote control provides full facilities.

BANK'S AIRPORT BRANCHES

THE Midland Bank recently opened branches at London Airport and Northolt and now, to-day, January 1st, a new branch has been opened at Croydon Airport. In addition to its Overseas Branch in London and Foreign Branches in the larger provincial centres, the Midland Bank's Travellers' Department in Piccadilly is well known, and interestingly enough it is the only bank with offices on board the great Cunard liners. The facilities offered cover a complete banking service at Heathrow and Northolt seven days a week, including Bank Holidays, and at Northolt the Bank remains open until 11 p.m.

daily. Incidentally, the Clydesdale Bank, one of the Midland's affiliated companies, was the first to open a branch at an Airport when its Prestwick office was established a year ago.

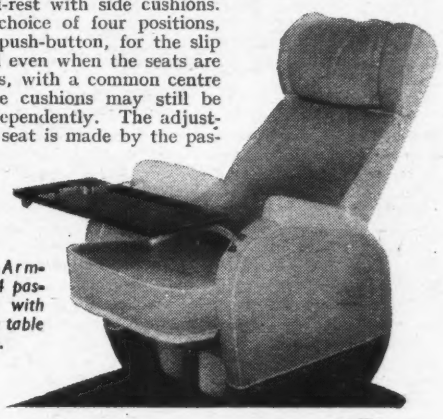
Among the Midland Bank staff at their Airport branches are experts in matters relating to foreign exchange, foreign banking business and experienced linguists. Many of them served in the R.A.F.V.R. during the war.

P.A.W.A. IN THE FAR EAST

PAN AMERICAN'S new Vice-President-Orient, Mr. William L. Bond, is to have his headquarters in Tokyo. He is resigning as director and vice-president of China National Aviation Corporation but is to be re-appointed by Pan American to continue as a director, subject to the approval of the Civil Aeronautics Board. Pan American has a minority share holding in C.N.A.C. Mr. Bond has been stationed in China since 1931 and under his direction C.N.A.C. built up a network of 3,000 miles of routes within China before 1937.

PASSENGER COMFORT

A NEW passenger chair, known as the Type 4, has been designed by Vickers-Armstrongs, Ltd. Of tubular steel with light-alloy framing, the chair is sprung and upholstered in moquette or repp with leather-covered arm-rests, and has a fixed head-rest with side cushions. There is a choice of four positions, selected by push-button, for the slip cushion, and even when the seats are built in pairs, with a common centre arm-rest, the cushions may still be adjusted independently. The adjustment of the seat is made by the passenger's own movement, the push-button releasing a plunger catch which is engaged again when the desired position is attained. The seat is lightly spring-loaded, so that if a passenger moves from "reclining" to "erect" the seat back follows the movement and if the button is pushed when the seat is empty it automatically moves to "erect." A mechanically operated version, using Miles electrical gear, is at the prototype stage.



The Vickers-Armstrongs Type 4 passenger's seat, with the detachable table in place.

Fittings include a quick-release safety belt, below-seat stowage for a lifebelt and personal effects, steward's call-button, built-in ash tray, magazine pocket, a detachable walnut table, and provision for making an electrical connection to a floor socket.

The minimum pitch of chairs for rows is 41in. The chair is built in excess of A.R.B. requirement D.27 and will withstand accelerations of 6g forward, 4g downwards and 3g upwards.

Production of the new seat is to begin shortly, and it seems possible that it will be placed on the market for general use. Before the war, Vickers-Armstrongs did a considerable business in components.

SAFETY DISCUSSION

THE full day has been set aside by the Royal Aeronautical Society for discussions on Safety in Civil Aviation on April 3rd this year. Introductory statements will be made and each will be followed by open discussion. During the morning session A.V-M. D. C. T. Bennett, Director and General Manager of B.S.A.A., will introduce the Economics of Safety, and Professor A. A. Hall, Air Safety Board, will follow with an introduction to the problems of Air Traffic Control. After a luncheon interval during which members and visitors are asked to make their own arrangements, Dr. K. G. Bergin, Medical Officer, B.O.A.C., will, at 2.30 p.m., give a short talk on the physiological aspects of safety. At 3.30 there will be general discussion, and from 4.30-5 p.m. tea will be provided. The evening session will start at 5 p.m. and will close after general discussion and a summing-up, at 6.30 p.m.

PAKISTAN GOVERNMENT AIR PLANS

THE Government of Pakistan has decided that civil aviation should be left for the time being to private enterprise, with state regulation and control, and it has been decided to licence only two companies for all routes to be operated. It is the policy for the two companies to have Pakistan capital and control, and subject to agreement with other governments the following services are planned:—

Karachi-Lahore-Rawalpindi-Peshawar; Karachi-Quetta-Lahore; Karachi-Lahore; Karachi-Delhi-Dacca-Chittagong; Karachi-Delhi; Lahore-Delhi; Calcutta-Dacca-Chittagong-Sylhet (in suitable order); Calcutta-Chittagong-Akyab-Rangoon; Karachi-Calcutta; Karachi-Bombay-Colombo; Karachi-Middle East; Karachi-East Africa.

Later, when experience has been gained, it is intended that one of the two companies should specialize in long-distance international services.

The formation of a third company for providing common facilities required by both of the operating concerns is also favoured, and this organization will repair, overhaul and convert aircraft, train engineers and provide other services. The selected operating companies will be invited to participate in this third company, and they will, together with the government, be given a share in the direction. With regard to the grant of licences, an official statement says that "consistently with the requirements of efficient service, preference will be given to applications which represent the greatest attainable degree of combination between the various national financial interests wishing to participate in the development of Pakistan airlines."

In requiring that applicants shall provide, to the satisfaction of the Director-General of Civil Aviation, modern aircraft and equipment and experienced personnel, it is also laid down that there should be a definite arrangement for training Pakistan nationals to replace, at the earliest possible stage, all foreigners initially required. There are to be a number of

***AMERICA'S No. 2:** The terminal building at Boston Airport, which, as mentioned last week, is second in size, to Idlewild.*

Civil Aviation News . . . . .

other requirements. Karachi will preferably be the headquarters of the companies chosen, to ensure close liaison between them and with the government; there may be restrictions on the transfer of the shares; they must be prepared to operate without subsidy all the routes for which applications are made; and standards of operation and servicing must be comparable with those of foreign airlines engaged in similar operations. As regards this last requirement, the provisions of the Indian Aircraft Rules 1937, Part XIII, as adapted by Pakistan, will apply. Any parties who desire to participate in the formation of the joint company for providing common facilities, but without having a licence to operate air transport services, can make applications to do so, and parties who have already made applications for licences to operate air services or to provide servicing facilities, as well as those who have temporary licences, have to make renewed applications.

The two "chosen instrument" companies will be allowed to operate non-scheduled services, but permission to operate in this field will also be granted to other concerns, under such restrictions as the government may impose.

THE RYAN-NAVION

ONE of the most attractive of the post-war American private aircraft, the Ryan-Navion, is in production. Developed by North American, this design was handed over to the Ryan Aeronautical Co. when the former company decided not to proceed with it. Among improvements now incorporated are an electric fuel pump in addition to the standard engine-driven pump; a 20-gall auxiliary tank, increasing range to 750 miles at 150 m.p.h. cruising speed; improved ventilation and temperature control; and better sound insulation. The Navion has already been in large-scale production, 1,100 of them having been built by North American.

BREVITIES

Mr. Jinnah, Governor-General of Pakistan, is to have a Viking aircraft for his personal use. A special interior arrangement has been designed.

* * *

Mr. W. R. Blyton, M.P., has been appointed Parliamentary Private Secretary to Mr. G. S. Lindgren, the Parliamentary Secretary to the Ministry of Civil Aviation.

* * *

An American air charter company was asked to postpone a flight with seven million tomato plant seedlings, owing to unsuitable planting weather at the destination. During the wait, the freight increased in weight from 44 to 79 tons.

* * *

It is now learned that first reports received in this country of the forced return of the *Severn*, the Short Solent flying boat, to Port Bell, Uganda, whilst on a proving flight to South Africa, were not accurate in ascribing the trouble to one of the engines. The failure was in an oil pressure transmitting gauge but the engines were examined as a precaution and were found to be serviceable.

* * *

The number of passengers carried by B.E.A. in November was less by nearly 50 per cent than those carried in October. Passengers carried in November were 26,037 while in the previous month there were 44,898. Mail figures remained comparatively constant. In spite of the fact of the holiday travel ban the Continental Division carried 9,689 passengers compared with 7,110 in the same month last year.

* * *

Immigration officers at Northolt airport have held a conference with the Home Office, and although details have not been divulged it is understood that the officers, some of whom have been at the airport since it was taken over for civil aviation, were originally engaged on a temporary basis, and have now been asked to teach permanent civil servants the job of interrogating travellers, while they themselves may possibly become redundant.

* * *

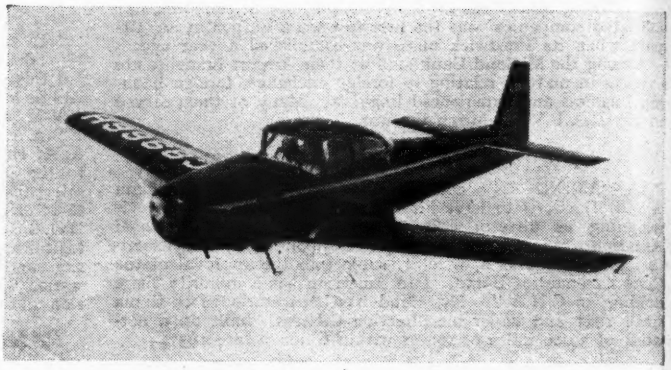
The Radio Range at London Airport has been brought into operation. The equipment, which was originally sited at Dorking and was withdrawn from service on October 29th, is now on a site a hundred yards from the Bath Road near the entrance to Heston. The call sign is MYR operating on a frequency of 362.5 kcs and the Radio Range magnetic courses are 013.5°A-099.5°N 193°A-281°N. The Northolt Radio Range and the H.F. Aeronautical Communications and Approach Control Service operating at Blackbushe have been withdrawn.

* * *

A two-months tour of Africa by Mr. J. T. Bata and senior executives of the western Bata shoe manufacturing organization covered 20,000 miles of flying. The aircraft used was a D.H. Dove operated by Airlinks, Ltd., an air transport subsidiary of Bata which is based at Gatwick, and the route was via the West Coast, Congo and Rhodesia to South Africa, returning via East Coast route and thence via Cairo, Rome and Zurich. Among the places visited was Addis Ababa, where the Dove took off with full load at 7,800ft above sea level.

* * *

A foreign air-carrier permit has been issued by the American Civil Aeronautics Board to S.A.S., the combined organization operated by the major Scandinavian airlines, and the individual permits issued to D.D.L., D.N.L. and S.I.L.A. have been cancelled. The permit authorizes S.A.S. to carry passengers, mail and freight between Stockholm, Oslo, Stavanger and Copenhagen and terminals in Labrador, Quebec and the alternative terminal points New York and Chicago with intermediate points in the U.K., Eire, Iceland, Greenland, the Azores and Quebec.



EX-NORTH AMERICAN : The Ryan-Navion, in its new gloss enamel finish, is one of the most attractive-looking private aircraft in the U.S.A. It is now in full production by the Ryan Aeronautical Company of San Diego.

FROM THE CLUBS

In spite of the high costs of flying, and petrol restrictions, membership of the Strathtay Flying Club, at Perth airfield, is increasing and now stands at 220. In the year ended July 2nd, 1947, nine new licences were gained, 27 being renewed, and Mr. A. N. Thorn acquired a Proctor, bringing the number of owner-members up to three. The annual general meeting has just been held and Major J. R. Couper, D.S.O., has been reappointed president.

* * *

An interesting scheme has been introduced by the Goodhew Aviation Company, the sponsors of the Oxford Aeroplane Club: It is for selling blocks of hours to members at an ever-decreasing date, and also to pupils, without it being necessary for them to become members of the club. The scheme started on December 1st, 1947, and under it the normal rate for dual and solo flying in Tiger Moths will be £3 per hour with blocks of hours on the following scale: 10 hours at £2 15s an hour; 20 hours at £2 10s an hour; 30 hours at £2 5s an hour; 50 hours at £2 an hour; and 100 hours or over £1 15s an hour. The latter number of hours is, of course, for the convenience of those who are obtaining their "B" licences. These blocks of hours are sold on a contract basis with payment in advance, and the pupil can then fly at any time to suit convenience. Dual blind flying instruction and cross-country flying are included in these block rates. A tempting bait is being offered to prospective pupils of trial lessons for £1 without obligation, and in addition, if any *ab initio* pupil buys an aircraft through the Goodhew Aviation Co., free instruction is given. It is the view of the company that, whether there is a club and private flying or not, expenses in the way of an airfield, premises, hangars, etc., are still there. In fact, in this as in many other instances, a commercial firm has subsidized private flying as a long-term policy because it believes in the future.

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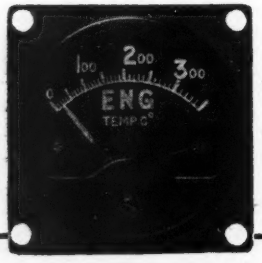

On the right is an illustration of the Model S64 WESTON Engine Cylinder Thermometer

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CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

WOMEN PILOTS

A.T.A. Records Show Equal Efficiency

WE are not concerned to argue the relative merits of men and women as pilots, but certain statements in the letters of your correspondents L. Heather and F. S. Symondson cannot, in fairness to the women A.T.A. pilots, be allowed to remain unchallenged.

Over a period of several years we had to examine daily, weekly, monthly and yearly the results achieved by each of the A.T.A. pilot's pools. The statistics which we had to analyse included the number of aircraft ferried, types of aircraft, hours flown, accident rate, illness rate, etc., etc., and from these returns we can state categorically that the two pools comprised solely of women pilots were in every respect as efficient as their male counterparts from whatever angle one chose to consider the results.

Furthermore, every A.T.A. pilot had a personal flying record card which contained the fullest details of his or her flying activities including numbers and types of aircraft ferried, hours flown, progress through the flying schools and accidents, the latter with a report from the A.T.A. Accidents Committee as to the cause of, and responsibility for, the accident in question. From close analyses of these cards it was abundantly clear that the efficiency or otherwise of a pilot had nothing to do with his or her sex. The women were in every respect as good as the men.

Various remarks have been made in the correspondence referred to endeavouring to compare the performance in A.T.A. of R.A.F. pilots and women pilots on A.T.A. ferry work. The fact is that quite specialized training was needed to produce a competent ferry pilot, irrespective of sex, and that this training was needed just as much by trained R.A.F. pilots as by anyone else before they could be converted into efficient and safe ferry pilots. After such training there was no difference between pilots of either sex.

GERARD d'ERLANGER. P. A. WILLS, B. L. BATHURST.

FLYING BOATS

Capt. Brice v. Capt. Courtney

LET it be agreed that on a number of occasions a flying boat can effect an alighting on the sea. Let it be also agreed that in this respect it has an advantage over the landplane. Considering, however, that at least a third, and sometimes a half of the major air routes are over land, this advantage loses a great deal of its significance. On the North Atlantic the route is mostly over water, but since, as I have already pointed out, *everywhere* north of New York ices up in the winter, the Atlantic is not a good flying-boat route. The sector Shannon-New York, of about 2,700 nautical miles, has great commercial as well as technical drawbacks, especially as there are no alternate routes such as the landplanes employ in the case of an excessive headwind component over the direct route across the ocean.

In spite of his superior age, I do not agree with Mr. Courtney's views that the land airport expansion which will be necessary in the future will be too expensive to be borne by all save the few remaining wealthy countries. All over the world big construction jobs are being undertaken. Bridges, tunnels, reservoirs, power stations, dams and other such utilities are being built, the cost of which certainly rivals, if not exceeds, that of the necessary strengthening or extending of existing runways. There is no reason that I can think of why civil aviation should become the poor relation of a country's utilities, especially as it is directly concerned with the external trading of any state.

Mr. Courtney's point that, with the proper airline organization behind it, the *Sky Queen* could have been salvaged, is not borne out by the facts of the other occasion on which a Boeing A314 landed in the sea. During the war Pan American Airways had one of their boats forceland in the Pacific, and although all on board were rescued, the salvage of the boat was considered to be quite impractical due to the very low towing speed which is possible with flying boats, and the yawing tendencies which develop.

"Air Transport Captain" is correct in his assumption about my unawareness of the artificial flying-boat base at Rome. I always used Lake Bracciano before the war. The conversion of a lake, such as at Alexandria, into a flying-boat base does not constitute constructing an artificial base, any more than the rolling-flat of some piece of desert can be compared with putting down a large acreage of cement.

His point that the laws of the Corporations prohibit him from indulging in controversial correspondence is not borne out by the fact that he is already writing letters to the Press. Surely any pseudonym would suffice to protect him from the wrath of the executive, if such wrath existed?

DAVID BRICE.

CUMBERBATCH TROPHY

Suggestions Invited

MANY people will remember that some years ago Miss Alice Cumberbatch presented to the Hanworth Club a trophy for presentation in competition. It was not, however, found possible to make the award.

Arrangements were concluded by which the trophy was presented to the Guild of Air Pilots and Air Navigators of the British Empire, who will award the trophy in respect of any act tending to increase reliability within British Civil Aviation. The trophy is an exceedingly handsome one designed by Omar Ramsden, and is of considerable intrinsic value. It is inscribed:—

"I was wrought in utmost faith and hope by command of Alice Beatrice Martha Cumberbatch in the year of Our Lord 1931 for the promotion of reliability in Civil Aviation—to the memory of those who have gone before and encouragement to those to come."

Apart from the difficulty of awarding anything among a number without dividing it up, there remains the delicate business of deciding what sort of act tends to increase reliability. Reliability is so essentially a growth, and the outcome of unostentatious work.

This trophy was originally given by Miss Cumberbatch to be awarded to those endeavouring to make air transport safer and more reliable, and in so doing the public would be encouraged to use the air. During and since the war, it has not been possible to make any award, but we now feel that the time has come for it to be put on a substantial basis. We are, therefore, at present endeavouring to draw up more concrete terms of award, and would be very grateful to receive suggestions and interpretation of the most suitable estimate of reliability, as it is felt that the term "reliability" is in itself somewhat vague

The underlying idea is that it should form an incentive for reliability in operation, and we should be pleased to have readers' views as to the most suitable points on which assessment may be made for the award of this trophy.

THE COURT OF THE GUILD,
Londonderry House,
Park Lane, London, W.1.

AIR TRAVEL

Make a Fuss of the Passenger

EVERYBODY who takes an interest in aviation matters has been dumbfounded by the colossal financial losses incurred by B.O.A.C. and B.E.A. As everyone knows, 1946 and 1947 were boom-years in air transportation. The clearing of the chaos left by the war, the claustrophobia of mankind locked in airtight compartments for more than five years, the general dislocation of life, coupled with a commercial and industrial *hausse*, have set the skies all over the world ahum.

Most Continental airlines have had a thumping good year, and it is, therefore, all the more surprising that Britain's effort should have resulted in such losses that had it not been for the Treasury (your pocket and mine) the companies involved would have ended in the bankruptcy court.

In spite of owning my own aircraft I travel a great deal on the airlines of Europe. Why is it, I have often asked myself, that I prefer K.L.M., Swissair, Sabena to B.E.A.? This summer I travelled some half-dozen times by B.E.A., just to see what it was like. From a technical point of view I admit there was little difference, apart from the fact that I prefer the Viking to the Dakota. But it was in the auxiliary services that the British lines fell short. Airlines do not live solely by the custom of Government officials and tired business executives.

Correspondence . . . . .

They cater for the general public and have to reckon with the foibles of the general public.

Now is there anything more discouraging than these little cellophane-wrapped enigmas B.E.A. calls "sandwiches"? Is there anything less inspiring than that brown swill that emanates from the pantry and which is called coffee or tea (depending on what you ordered) but which doubtless comes from the same tap. Or the solidified sandstorms termed "biscuits"? At the end of that "meal" you are presented with the bill.

No doubt the board of directors of B.E.A. think all this pretty trivial. No doubt they know that Swissair presents their clients with little golden badges and a little map with writing-paper, timetables, maps. That K.L.M. serves a first-class meal without charge (as do most other airlines).

They may rightly point out that their radio equipment is second to none, their pilots' i/f abilities far greater, and the oil in the crankcases cleaner. *But does Mrs. Boghouse care?*

Do the chaps in the tower of Airways Terminal (I always imagine that is where the boss of B.E.A. sits) know that Mrs. Boghouse loves to get something for nothing? Just one of these little attentions. Most of what Mrs. Boghouse remembers of her trip to Blahville last summer was "that lovely lunch-box with the cellophane-wrapped grapes, the sweets, the cigarettes." ("And do you know, my dear, they did not charge a penny.")

Do they not know that a tired business man prefers a stewardess with a smart coquette peak cap and nylons instead of a civilian Wren. Instead of all the above amenities the Captain comes out of the cockpit to have a chat with the cash-customers. I am always sorry for the poor devils, their embarrassed smile as they make a personal appearance tour round the "house." Always the same question "Are you comfortable?" followed by some non-committal meteorological observations followed by a vague E.T.A.

No, if we want to catch the customers and hold them, we shall have to do better. The equipment is first-class, the airport facilities are constantly improving, the crews competent to a degree. This the customer expects and uncritically accepts. Now let's concentrate on the traveller, you know the chap that forked out the cash to begin with. On the British railways (for reasons buried with the industrial revolution) the traveller was an afterthought and so he remains to this very day. Let's not make the same mistake on our airlines. Let's concentrate on the traveller. Let's woo him, make a fuss of him. And if the petty cash can't stand it, let's increase the fare by half a crown and *give* not sell the lunch-box (cost price 1s 6d maximum). What difference does it make on a £10 ticket. Never forget that air transport is a foreign exchange getter. Give the traveller a little badge for the kids, notepaper, magazines and maps, even a signed photograph of the Minister of Civil Aviation (if he cares for that sort of thing). Anything to keep him happy and interested—Yes, like children. For travelling induces that spirit of excited expectation in adults of which normally only children are capable.

W. VAN LEER.

AIRFIELD APPROACH SYSTEMS

S.B.A. Equipment Available

WHILST admitting that under certain circumstances "Great strength returns the penny," I'm afraid "Campanologist's" series of blunt assertions and assumptions (*Flight*, December 11th) fail to "ring the bell" with me.

Let us take his points *seriatim*. First, the marriage of S.B.A. and I.L.S. "lacks realism and . . . would result . . . in chaos"; this is pure assertion, and it would be interesting to hear how the provision of an additional facility could produce chaos.

It is agreed that it is impossible to "achieve any universal interim standardization," but the greater the degree to which this is achieved the less is the chance of chaos. Why not, then, use as a basis the standard British system of S.B.A., adding the I.L.S. as it becomes available, but utilizing the S.B.A. equipment instead of discarding it as a dead loss? This, in fact, was what I suggested.

The assertion that S.B.A. airborne equipment is difficult to obtain is hardly correct. Six-stud pattern S.B.A.s are readily obtainable on a large scale as R.A.F. surplus. The statement that no American airline operator would fit S.B.A. for use at London Airport alone leaves me gasping! Surely "Campanologist" must realize that not only is almost every civil airport in Great Britain S.B.A.-fitted or about to be so fitted, but that scores of R.A.F. airfields are also equipped and would thus be available for landing in emergency.

This fact must be most prominently remembered by anybody attempting to replan the Airfield Approach System pattern of this country. S.B.A. is our present standard system and will remain so until supplanted, and most careful co-ordination of manufacture, supply and installation of the new equipment will be necessary to avoid utter confusion during the replacement period. Thus, by using the married system of I.L.S. and S.B.A., and the retention of S.B.A. equipment in use both on the ground and in the air, one of the major difficulties otherwise likely to be encountered would be avoided.

The limitations quoted were recommendations of B.A.L.P.A., and both my co-instructors and myself have made use of S.C.S.51 below the figures quoted—the principal difficulty was locating the hangar! I can, therefore, reasonably claim to be aware of the system's limitations, but can "Campanologist" say the same?

The final paragraph is almost too good to be true, for "Campanologist," who carps at my suggestion of utilizing two Airfield Approach Systems by an economical process of installing the Standard System immediately and adding S.C.S.51 as available, promptly suggests using: (1) an M/F beacon for radio compass homing; (2) B.A.B.S.; (3) S.B.A. or I.L.A.; and (4) G.C.A.! There are quite a few airfields in Great Britain, "Campanologist," and G.C.A. alone costs approximately £200 per twenty-four hours of continuous watch!

"RESURGAM."

BOOK REVIEW

"Birds on the Wing," by John Barlee-Collins, 12s 6d.

JOHN BARLEE, an Irish-born naturalist, has written a book which could not be better named. *Birds on the Wing* is a book of photographs, containing some of the best ever taken of birds in flight. It is the result of several years of perseverance and experiment in an attempt to arrest the fastest movements of flight, and to learn more of the extremes of wing position and the use of tail and feet for control in the air.

Looking at his pictures one cannot help noticing how much the bird is influencing the trend of modern aircraft design. Evolution and adaptability to surroundings has given us a diversity of bird types, each developed for its particular way of life. They range from the flightless antarctic penguin, the ostrich, the "bootpolish" kiwi to the ocean-going migrants—the great wandering albatross, the shearwaters, gannets and the gulls, birds in which aerial efficiency has reached something to be marvelled at. These are surely the ones to watch so as to learn from their ways, for they cover the distances, and theirs is the necessity to endure. Yet only recently have some of their lessons been applied in aircraft design. They are high-winged and of high aspect ratio, cantilever, with smooth fillets running into the body. Their eyes—the pilot—in front, helpful for landing and take-off and the better to find their fish. For cleanliness of line their feet retract and they use their tails for control in both planes, as now do the Beechcraft Bonanza and the 34. One wonders when all fuselages will be shorter in comparison with their beam, as is the herring gull, and the D.H.108, and when aircraft will have an infinite speed range and be as infallible in navigation as the arctic tern!

But John Barlee's book is by no means a treatise on aerodynamics. He is an ornithologist, and his book is of birds. He has written mostly about Ireland, the wild geese that winter on the Wexford Slob, the swans that come to Cull, the great sea-fowl colonies on the rocky islands off-shore. *Birds on the Wing* will appeal to everyone with a fondness for such things, and many more besides.

K. S.

FORTHCOMING EVENTS

Jan. 5th.—R.Ae.S. (Derby): "Aircraft Photography." John Yoxall.
Jan. 6th.—R.Ae.S. (Belfast): "Some Experiences in Experimental Gliding." Prof. Hill, M.C., M.Sc., M.I.Mech.E., F.R.Ae.S.
Jan. 7th.—R.Ae.S. (Southampton): "Rotating Wing Aircraft." C. G. Pullin.
Jan. 7th.—British Interplanetary Society: "The Man-Carrying Rocket." R. A. Smith F.B.I.S.
Jan. 7th.—R.Ae.S. (Luton): Discussion evening. Subjects: "Aero engines." "Aircraft." "Flying and Gliding."
Jan. 7th.—R.Ae.S. (Preston): "Problems of High-speed Flight," D. L. Ellis, B.Sc., A.R.T.C., F.R.Ae.S.
Jan. 14th.—Royal United Service Institution: "Higher Command of the Armed Forces." Air Vice-Marshal E. J. Kingston-McCloughry, C.B.E., D.S.O., D.F.C.
Jan. 15.—Royal Aeronautical Society: Joint lecture with the Institute of Fuel. "Gas Turbine Accessory Systems." O. N. Lawrence, A.F.R.Ae.S.
Jan. 15th.—R.Ae.S. (Gloucester and Cheltenham): Film on Rocket Flight.
Jan. 17th.—Royal Aeronautical Society Reception at No. 4, Hamilton Place.
Jan. 20th.—R.Ae.S. (Bristol). Debate.
Jan. 20th.—R.Ae.S. (Graduates and Students) Helicopter Films. Commentary by Captain Cyril Turner, A.F.C.
Jan. 24th.—Royal Aeronautical Society Reception at No. 4, Hamilton Place.

"Flight" photograph.

CONTRAPROPPED : An experimental version of the Fairey Firefly IV fighter reconnaissance machine with contra-rotating Rotol airscrew. The standard Firefly IV is still being produced at a healthy rate.

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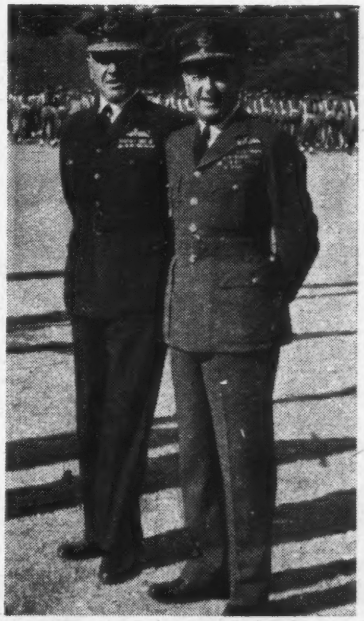
British Empire Medal

Corporal William John May, Royal Air Force, R.A.F. Station, West Malling.

ON Saturday, February 1, 1947, following severe frosts, a fault developed in the foundation of the station water tower. The tower is of braced metal construction, ninety feet high, and carries two static tanks. At the time of the occurrence there were 120 tons of water in one tank, whilst the other was empty, thereby imposing an unequal strain on the tower. Due to the strain the tower began to lean until it was 3ft 9in out of plumb from the base. It was apparent that unless the water could be released from the full tank the entire structure would collapse and cause severe damage to surrounding buildings. It was discovered that, owing to frost, the emergency relief valve for the tank was frozen and inoperative, and a volunteer was called for to climb the tower and attempt to free the valve with a blowlamp. Corporal May immediately offered his services, ascended the tower, and remained at the tank for 30 minutes, working on the relief cock. During this time the structure was in a dangerous state, as the tower was still gradually subsiding and cross-members were progressively shearing. Corporal May only descended at the last moment when the collapse of the tower appeared imminent but, unfortunately, he had not succeeded in freeing the relief cock. It was immediately necessary to resort to rifle fire to release the water and thereafter the tower remained stationary, although by this time the majority of the bracing structure had parted. Corporal May showed nerve, initiative and a high sense of duty in ascending the tower in an attempt to release the water and thereby prevent severe damage to other station installations. He is typical of that rather rare type of junior N.C.O. who, by his conduct and the example he sets at all times, does so much, unselfishly and without thought of reward, to improve the standard of discipline and morale in the Service. The example he set on the particular occasion cited above is typical of him and linked with his conduct generally is deserving of recognition, Corporal May, by his initiative and hard work, has at all times been an example to other N.C.O.s and airmen and he has made a considerable contribution to the raising of morale within his unit.

Royal Air Force and Naval Aviation News and Announcements



TOKYO PARADE : Air Vice-Marshal C. A. Bouchier, C.B., C.B.E., D.F.C., Air Officer Commanding B.C.A.I.R. (right), with A.V-M. J. P. J. McCauley, C.B.E., Chief of Staff, B.C.O.F., at the parade in Tokyo to celebrate the Royal Wedding.

Australian Appointment

G/C. F. HEADLAM, lately returned from the R.A.F. Staff College, has been appointed Director of Training at Royal Australian Air Force H.Q. He joined the R.A.A.F. in 1934.

More Squadrons for Auxiliary Regiment

NEW squadrons of the Royal Auxiliary Air Force Regiment are now forming in seven areas. They are No. 2502 (Ulster), at R.A.F. Aldergrove, Northern Ireland; No. 2504 (County of Nottingham) at R.A.F. Hucknall, Notts; No. 2602 (City of Glasgow) at R.A.F. Bishopbriggs, Glasgow; No. 2605 (County of Warwick) at R.A.F. Honiley, Warwicks.; No. 2608 (North Riding) at R.A.F. Thornaby, Middlesbrough, Yorks; No. 2612 (County of Aberdeen) at R.A.F. Dyce, Aberdeen; and No. 2616 (S. Yorks) at R.A.F. Municipal Airport, Doncaster, Yorks.

Recruiting is open to all suitable candidates wishing to undertake paid spare-time service, but ex-servicemen, especially those who served in the R.A.F. Regiment during the war, will receive priority. Apart from gunners there are

Service Aviation . . . . . .

vacancies for drivers, mechanics, clerks, wireless operators and cooks. Volunteers should apply to the Adjutant of the Auxiliary Regiment Squadron.

The total number of R.Aux.A.F. Regiment Squadrons is now twelve, the other five squadrons being No. 2501 County of Gloucester, R.A.F. Filton; No. 2603 City of Edinburgh, R.A.F. Turnhouse; No. 2604 County of Middlesex, R.A.F. Stanmore Park; No. 2609 West Riding, R.A.F. Yeadon, Yorks; and No. 2611 West Lancashire, R.A.F. Woodvale, Nr. Liverpool.

10,000 Spare-time Hours

FLYING hours completed by officers and aircrew of the twenty Royal Auxiliary Air Force flying squadrons since the units began to form a year ago total more than ten thousand, the top scorer being No. 613 (City of Manchester) Squadron, R.A.F. Ringway, with 1,078 hours in the air. This total is expected to be considerably more in the next year of training, for some of the units did not begin full operation until well into 1947. Most of the flying was put in on Spitfires and Mosquitoes, but it is hoped jet aircraft will be used next year as they become available for issue.

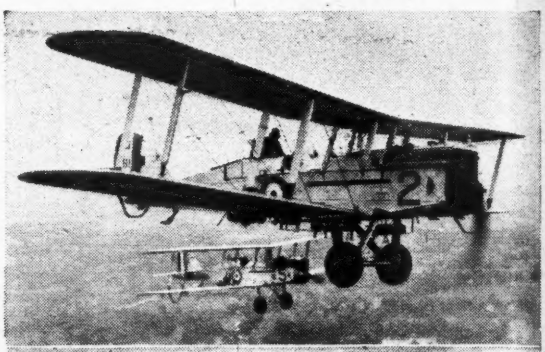
Home for Aged Officers

THE R.A.F. Benevolent Fund has contributed £10,000 towards the purchase and equipment of a home for elderly officers which is now being established at Frimley, near Camberley. The home will accommodate 30 officers of all the Services, a proportion of the vacancies being allotted to the R.A.F. It will be the first of its kind in the country and it is hoped to establish other homes later. Capital cost of establishing the home will be £40,000. The R.A.F. Benevolent Fund has also undertaken to devote £1,000 a year towards its upkeep.

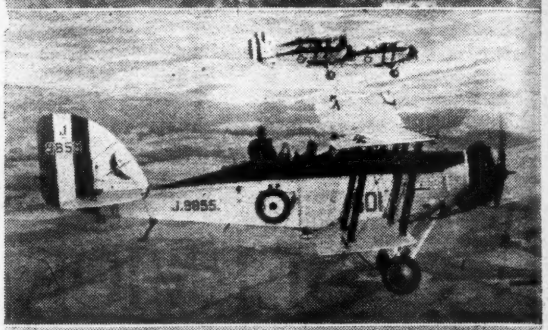
Reunion

NO. 604 Squadron, R.Aux.A.F., will hold a reunion dinner for past and present officers and aircrew of the squadron on Saturday, February 28th. All interested should write to F/L. J. N. Howard-Williams, D.F.C., Adjutant, No. 604 R.Aux.A.F. Squadron, R.A.F. Station, Hendon, London, W.9.

R. Aux. A.F. Equipment, Past, Present and Future

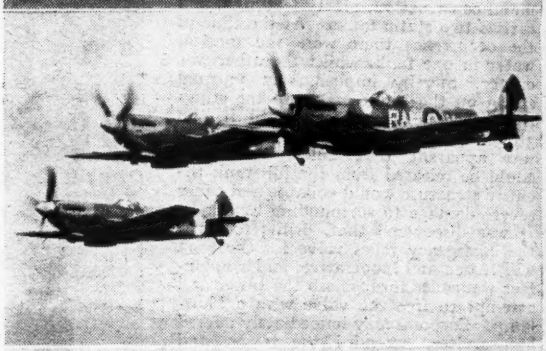


The Liberty-engined D.H.9A first armed Auxiliary Squadrons in 1925. Its top speed corresponded roughly to the approach speed of the Vampire, which is low by modern standards.

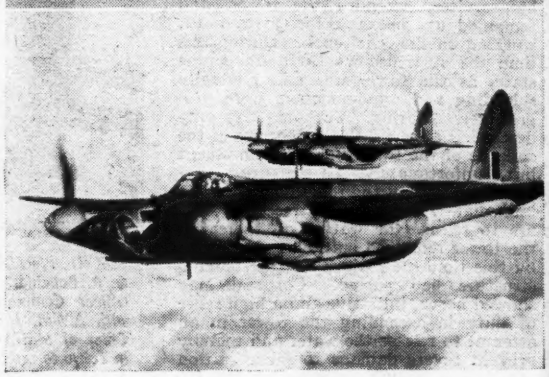


Successor to the "Nine Ack," the Westland Wapiti, with its Bristol Jupiter engine, achieved over 130 m.p.h. A more powerful development—the Wallace—also saw service.

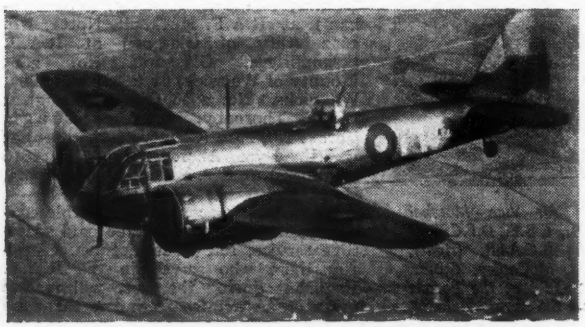
With the introduction of the Hawker Hart (R.-R. Kestrel) speeds rose by some 40 m.p.h. Armament remained essentially as on the D.H. 9A and Wapiti—one Vickers and one Lewis gun.



Spitfire XVI fighter bombers form the equipment of several Auxiliary units. Re-equipment with jet aircraft may be expected during 1948.



Just prior to the war some Auxiliary Squadrons were using Mercury-engined Bristol Blenheims (below), the first twin-engined type to be issued. Night fighter and light bomber squadrons of the R.Aux.A.F. are armed with D.H. Mosquitoes (lower right). Bomber squadrons will soon be re-equipped for fighter duties.



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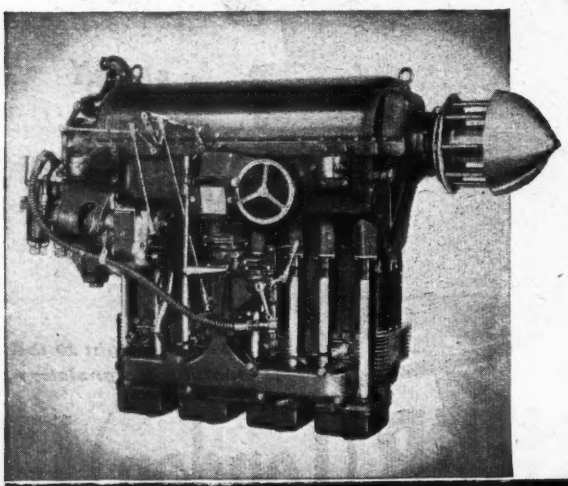

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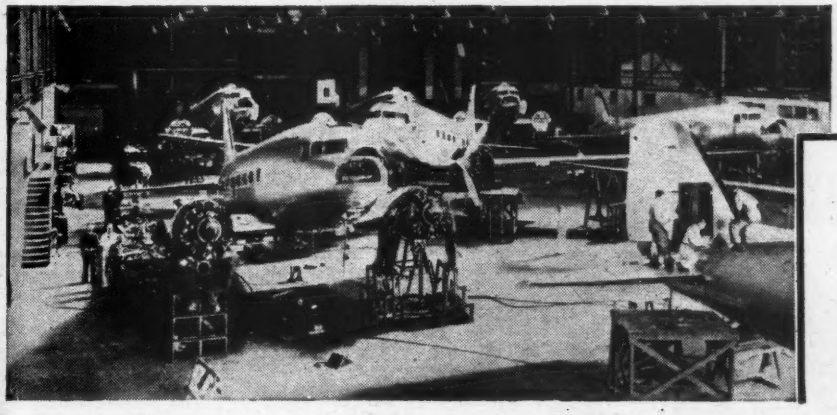

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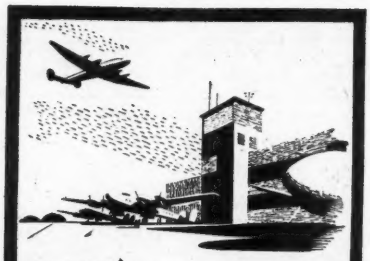

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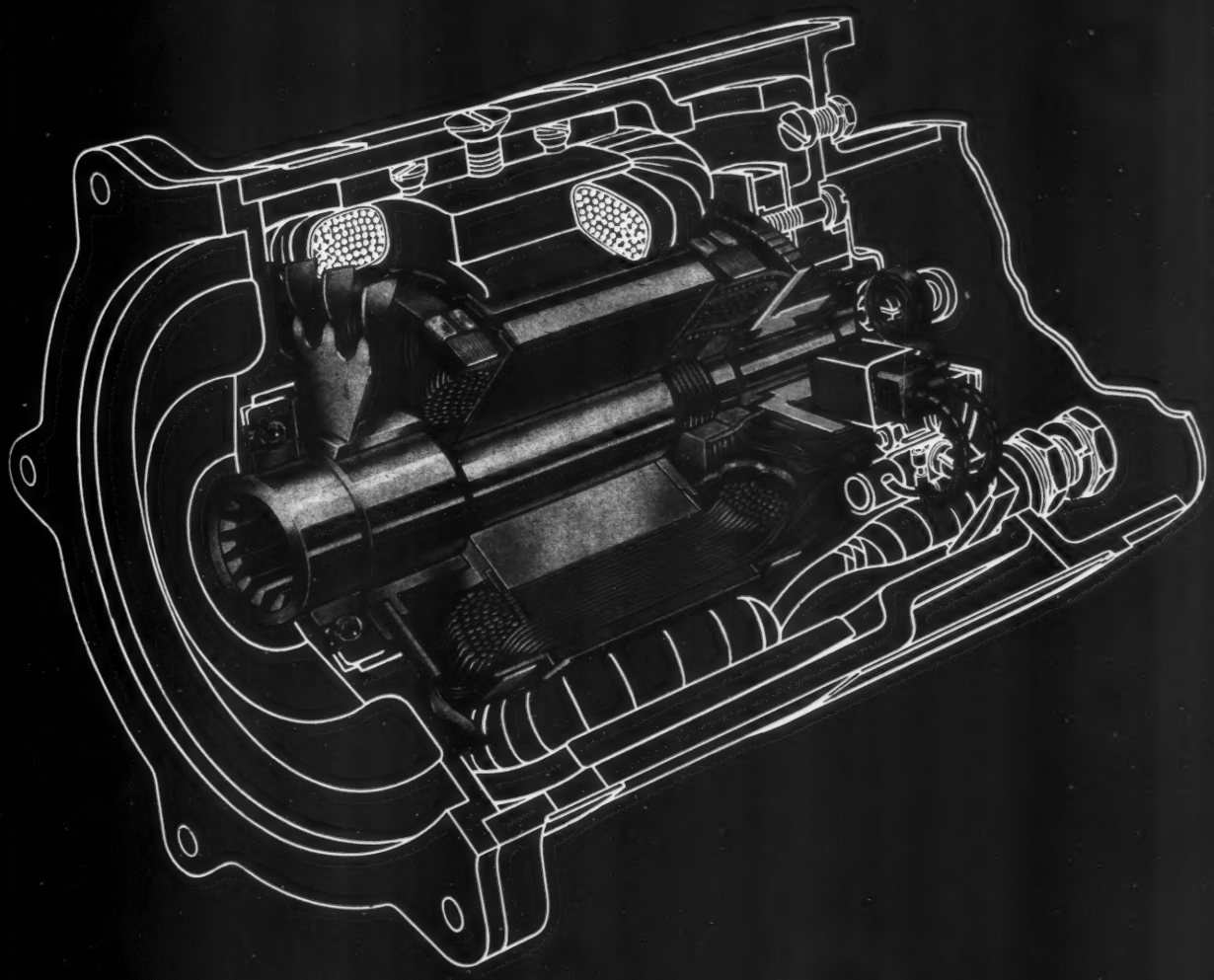

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